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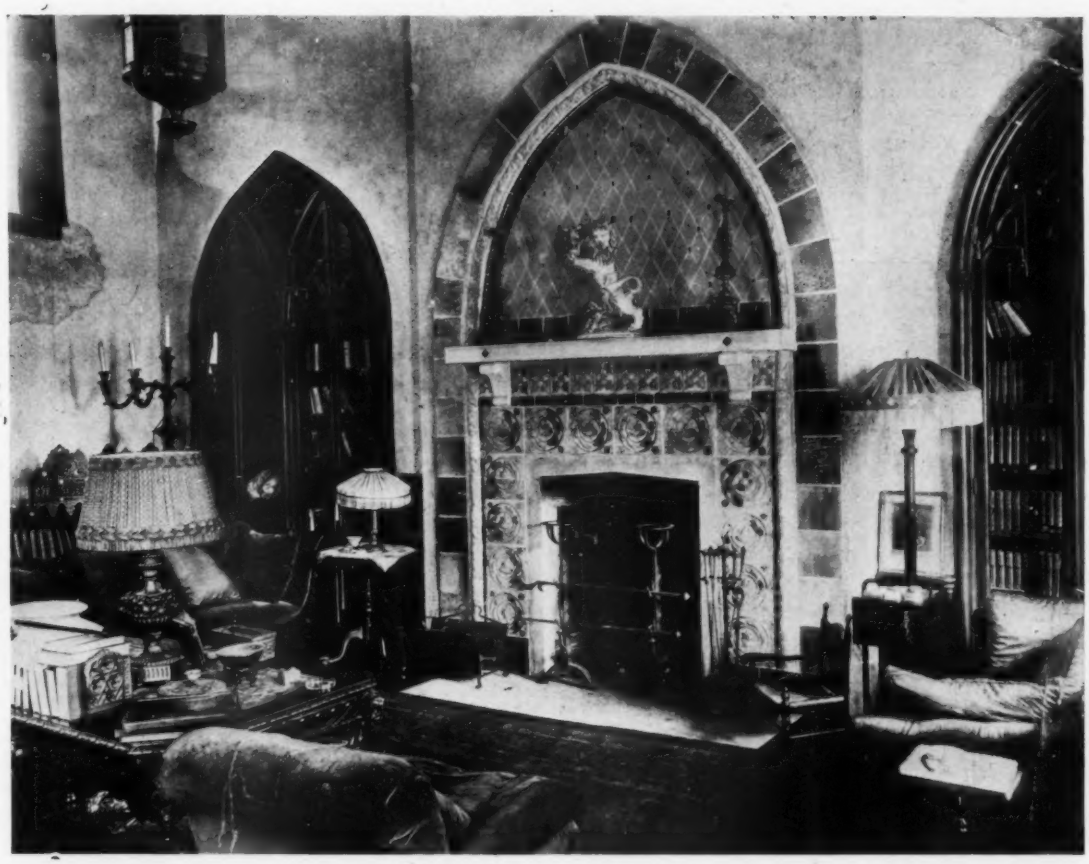

THE LIVING ROOM

THE HOUSE in WASHINGTON, D. C., of GEORGE OAKLEY TOTTEN, ARCHITECT

WHEN an architect designs for a client there is the natural impression that he has been more or less influenced by certain insistencies and that he has been compelled to introduce features which, if he followed his own judgment, he would not have considered. But, when he designs a house for himself, it may be taken for granted that it is the fulfilment of his own ideals, and as far as it is possible for him to accomplish it, he has created a result such as he thoroughly approves.

The house and garden of Mr. George Oakley Totten, of Washington, located in the very heart of what is known as the "Embassy District," are surrounded by the most aristocratic neighbors, but lose nothing in importance by such dignified surroundings.

Indulging in a hobby for collecting, such as is the custom with most architects, Mr. Totten, on his many trips abroad, brought back with him furniture and other accessories, all of which he has introduced into his well designed and equally well planned house.

The very simple character of this house is its greatest charm. It would not be possible to place an exact architectural style. The details are un-

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usual, suggesting Spanish motives, and yet not the Spanish of Spain, but a dialect, so to speak—the Spanish Colonial of Mexico, perhaps. The ornament applied is unusually fine in detail. The general tone of color of the house is a light grey, and the stucco has a most interesting and admirably executed texture.

The brackets of the main cornice are hand-carved in polychrome, and like every detail of the house, declare the touch of the artist. In fact, these brackets were either painted by Mr. Totten himself or reproduced by the craftsman from Mr. Totten's original color scheme.

Free standing in its large garden, the house as to size is very deceptive in appearance, and it is only when one enters that it is found the house is of unusual dimensions.

The staircase in the central hallway is of walnut, with a well designed Gothic rail, while the floor is tiled with square black and white Italian marble tiles. On the right is an attractive studio or living room. This room is a two-story vaulted enclosure which gives an air of spaciousness and feeling of size that one does not realize when viewing the house from the outside. The proportions of this room have been admirably studied. It has a groined vault in smooth white plaster, with walls of a warm grey tone and a most artistic texture. The wood is old and carefully selected walnut, with hangings of the same rich brown tone. The whole enclosure suggests a mediæval Italian room, and its restfulness has been assured by a careful and artistic selection and manipulation of the materials employed, and the various accessories to be found in the room.

A balcony from the second story hall and a small bay window from one of the second story rooms look down into the studio, while on the opposite side of the room are Gothic bookcases built into the wall. The principal feature is the great fireplace. The twelve large square Spanish tiles above the opening suggest the decorative scheme. These tiles were brought from Spain by Mr. Totten a long time ago, and about them, he states, he made the design. The hangings and furniture are all evidences of Mr. Totten's artistic sense as to color, and were "picked up" by him on his various visits to Europe.

TWO VIEWS IN THE JAPANESE ROOM

A marked contrast in size to the spacious living room is the small dining room just across the hall, but it is only small by contrast. Its ceiling and decorative treatment are in the Adams style, and every detail and bit of moulding to be found has been carefully selected or worked out by the architect. The ceiling in this room is unusually fine. It is of moulded white plaster, while the walls are paneled also in plaster, finished in a dull yellow tone. The floor, like that of the living room, is light oak parquetry. The over-mantel is gold, while the hangings are a rich dark blue, and the Adams furniture

HOUSE OF GEORGE OAKLEY TOTTEN, JR., ARCHITECT, WASHINGTON, D. C.

XUM

mahogany, carrying to completion, and without a single artistic discord, the decorative harmony of the room.

An interesting feature of this house is the added room, built to contain the famous "flower festival" Japanese room which was originally installed in the New York residence of Mr. Charles T. Yerkes. This fine specimen of Japanese architecture and decoration which has been acquired by Mr. Totten

THE DINING ROOM

indicates the possibility that may be reached in the extension of this somewhat unusual house.

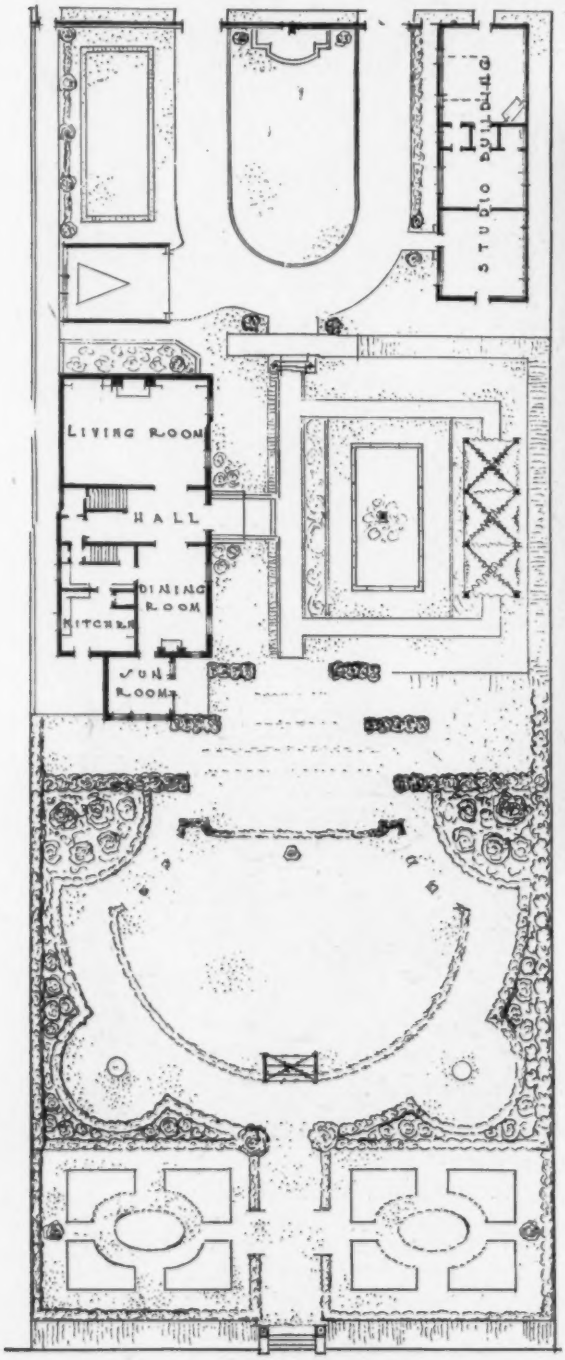
On the second floor there are the usual sleeping apartments, bath room, and a well placed sleeping porch, while on the third floor there are servants' rooms, store rooms, a cedar closet and a laundry. While it is customary to place laundries in the basement or cellar, it is not always desirable to do so, as in houses setting low to the ground cellars are dark and do not afford sufficient light for laundry work. For this reason, the laundry was placed on the top floor. There are a dumbwaiter and a chute to the lower floors, so that the laundry may be quickly and efficiently handled without unnecessary labor.

While this house has been designed by Mr. Totten with all the affectionate care that a man would give to his own dwelling, and shows the combination of every artistic impulse, the general conveniences that should be found in every modern dwelling have not been omitted, and the entire building is equipped with every modern housekeeping device.

The garden at present is a garden in the making. It covers over half an acre. As before stated, this house is centrally located in the "Embassy Section." Directly across the street is the Spanish Embassy; to one side is the home of the former Russian

MAIN ENTRANCE DETAIL
HOUSE OF GEORGE OAKLEY TOTTEN, JR., ARCHITECT, WASHINGTON, D. C.

Ambassador; to the other that of Mrs. Marshall Field, and next to that the French Embassy. All of these buildings were designed by Mr. Totten, and represent as many styles, each good in itself.



GARDEN THEATRE AND STUDIO
HOME OF GEORGE OAKLEY TOTTEN, JR.,
WASHINGTON, D. C.

The garden, as will be seen, is laid out on the French theatre plan type. It is already taking on some of the aspects that will make it a beauty spot in a section already famous for handsome buildings.

Neither this house nor its surrounding garden is finished, nor is it meant that they should be. It is a house and garden to which one may give care and

EXTERIOR DETAIL, SHOWING WINDOW TREATMENT

study year after year, watching its development and growth in the same way that the painter will labor over his picture, adding here and changing there, building up its "quality," adding to its beauty of color. It may never be finished in the sense that one regards completeness, but the very beauty of it is that it will serve for all times as a place where a man of correct artistic perceptions may devote his spare hours in the most beautiful and satisfactory elements of a true recreation, both mental and physical. Typically the house of an artist, its growth and development will be along artistic lines. No recreative elements that enter into the daily life of the artist architect can be greater than those attending the development of his own home. A thing of beauty, created as a result of his temperamental attitude toward his daily life, it will become a joy forever.

At Left:
Detail of living room in house of George Oakley Totten, architect, Washington, D. C.

Below:
An apartment living room in building, 64 East 55th street, New York, comprising architects' offices, single and duplex apartments.

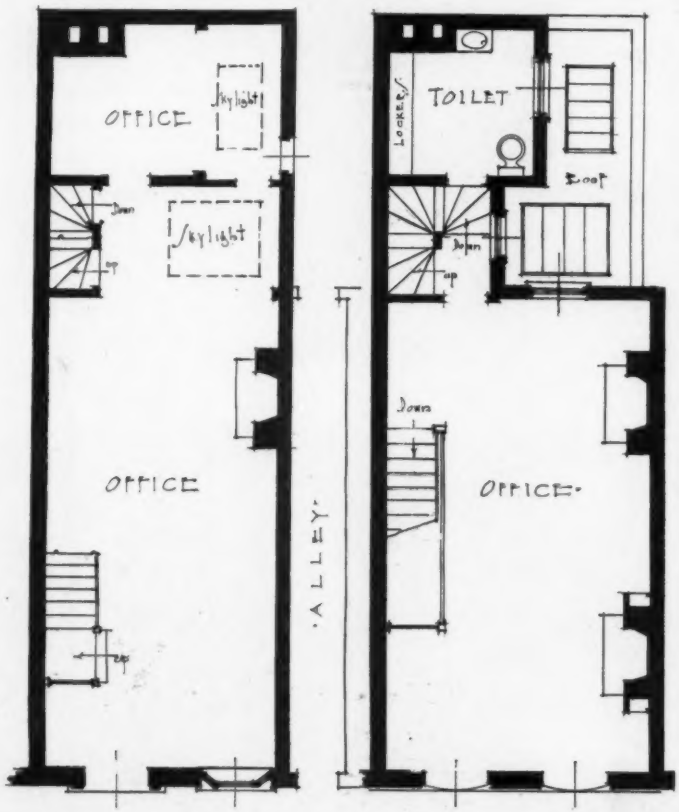
HARRY ALLAN JACOBS
ARCHITECT

ARCHITECT'S OFFICES SOLVING HIGH COST OF OFFICE RENT

By C. A. ZIEGLER

WHAT to do with the small dwelling houses that have become stranded in the business districts of our cities owing to the encroachment of commercial enterprises upon old residential sections, has always been a problem, but the profiteering landlord, paradoxical as that may seem, has really done a good work in forcing the office seeker to consider the advisability of remodeling these old dwelling houses for office purposes.

With office rents being raised 100 per cent. or more, and the cost of building increased to an even higher level, the erstwhile contented cliff dwellers who transacted their business in the high altitude afforded by the modern skyscraper have found that the long-neglected dwelling houses that were a drug on the market for years could be converted into office buildings at a cost that very often gave the investor his office rent free if he rented portions of the building to other tenants, and in any event gave him perfectly satisfactory quarters at a very low rental charge.



BUILDING, 208 SOUTH THIRD STREET, PHILADELPHIA

The exodus of the professional man from the larger office building was the natural result of the tremendous increase in rentals, as no class of men felt the hardships of war conditions more keenly than the professional class, and they simply could not meet the post-war demands for a higher rental.

Material men and manufacturers automatically received a higher price for their commodities during the war owing to the great demand for their goods. The memory of the profiteering by the laboring class during the war is still a blot on the escutcheon of the working man, but when the services of the professional man were required by the government, it was generally furnished at a rate lower than was customarily charged in private practice, and no provision was made to reimburse him for the time necessary to re-establish his private practice when the war was over, although manufacturers received very material aid in reorganizing their businesses.

To meet their necessity, many professional offices combined forces and bought or rented old buildings near active business centers in our larger cities and converted them into office buildings. So satisfactory have these quarters been found that reports show many plans are on the boards for similar projects.

As in most real estate ventures, the success of the project depends upon the ingenuity of the designer in planning the improvement. Nothing pays a larger return in real estate investing than a successful plan, and yet most alterations of this character are usually done carelessly and fail to make any impression upon the casual observer.

Those who successfully solve the problem obtain a greater individuality for their business than was

possible in a larger office building and avoid the confusion and noise caused by the rush and bustle that seem unavoidable in the halls and elevators of the modern skyscraper, and as most old residences that were left stranded in the business centers of our large cities were once the homes of prosperous men of affairs, they usually contain old mantels and stairways which add an atmosphere of refinement to the professional office, seldom obtainable in the average commercial office building.

The accompanying photographs and plans show dwelling houses that were converted for office purposes, and in each case the owner secured much better accommodations than could have been obtained in a skyscraper for the amount represented by the interest on the investment.

The building at 208 South Third Street, Philadelphia, was originally very much like the adjoining buildings shown on the photographs. All the interior partitions were removed and a new front of Colonial design was added. This gave the tenant three stories of well-lighted and ventilated office space and an individuality that makes itself felt in the community.

At 132 South Fourth Street, Philadelphia, practically the same thing was done, and in addition a small warehouse was erected on the rear of the lot, with an entrance opening into same from the rear street. This arrangement gave the cotton brokers who occupy this building an unusually convenient arrangement at a very low rental cost.

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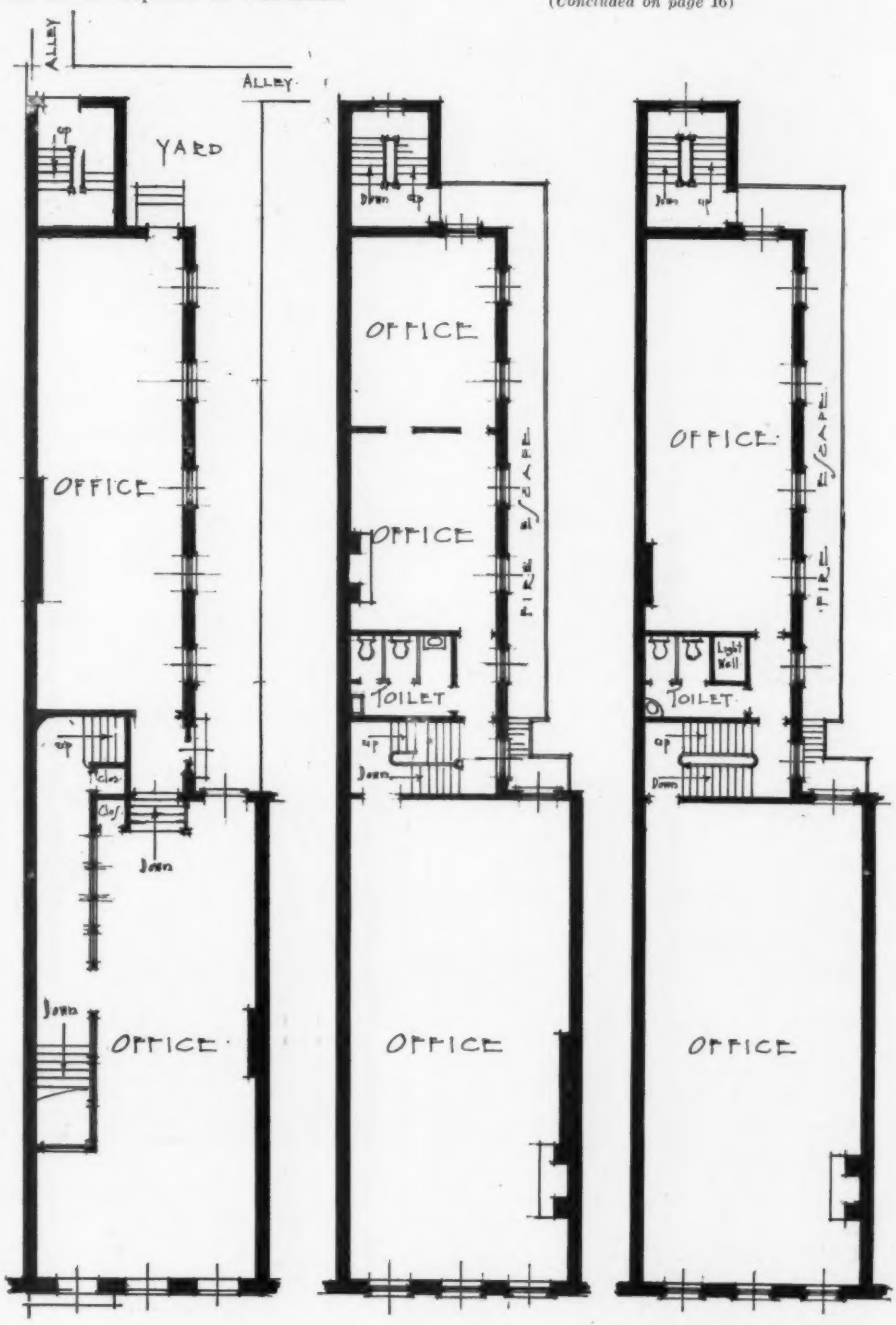
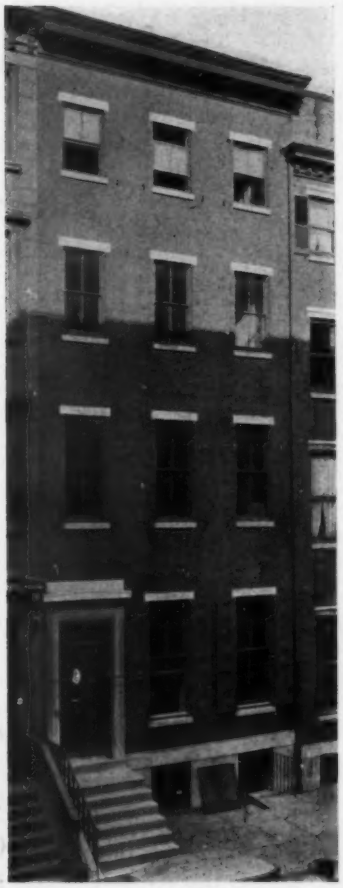
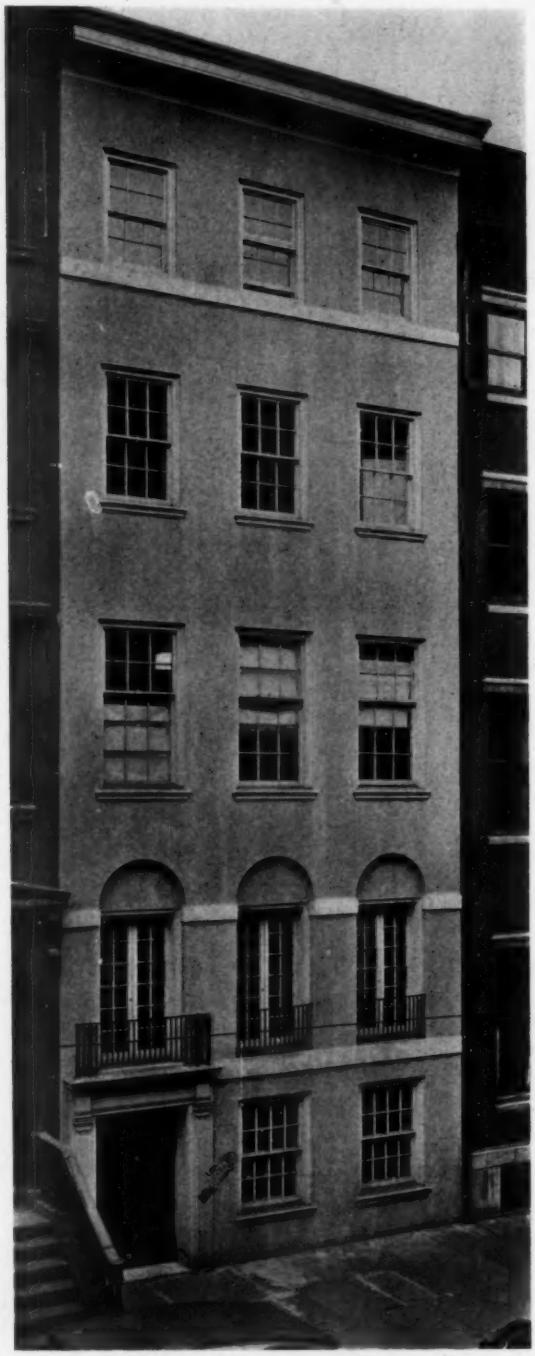


BUILDING, 1309 LOCUST STREET, PHILADELPHIA, PA.



BEFORE ALTERATION

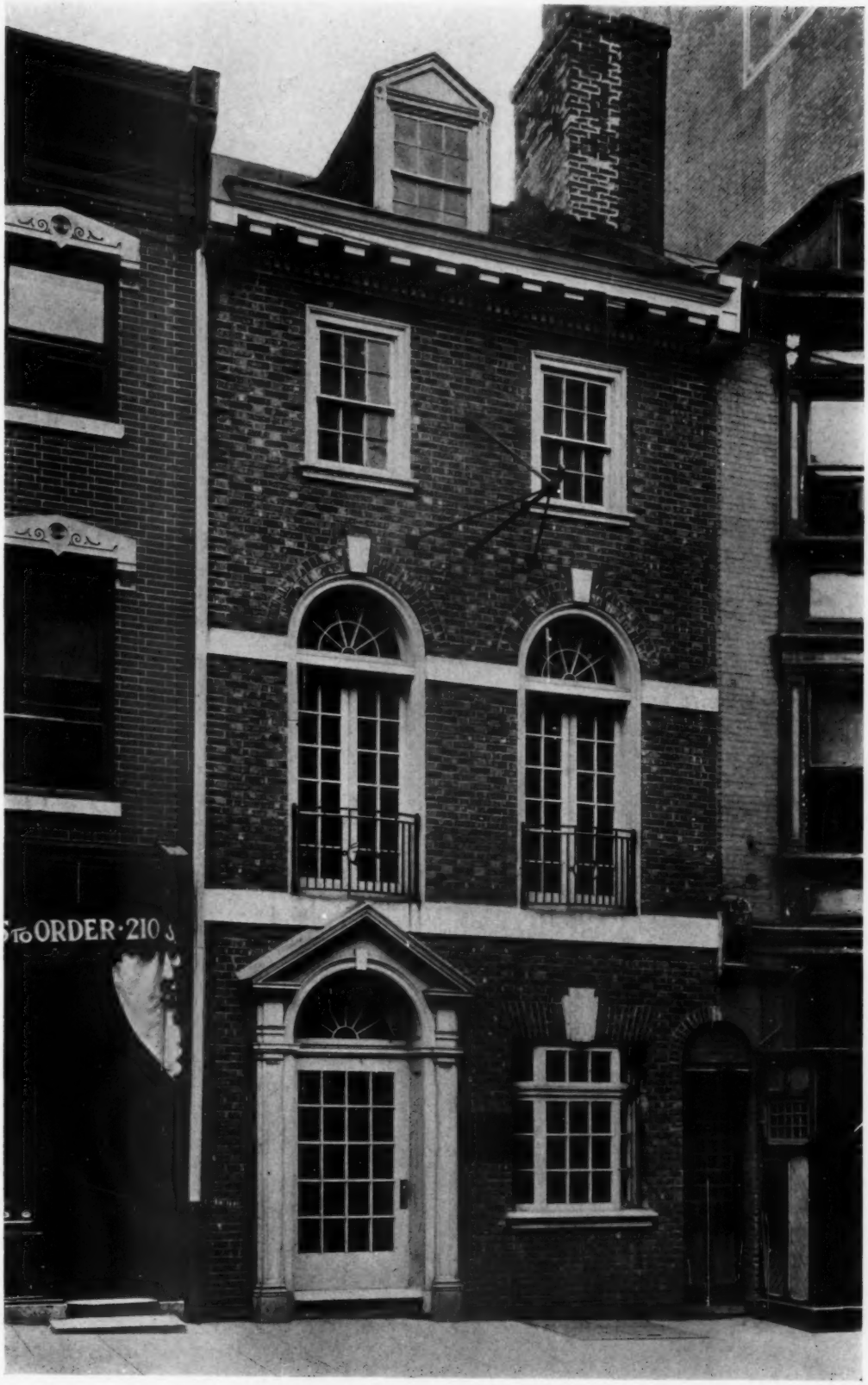
THE building is situated one square from Broad street, which is the largest boulevard of the city and was until recently a very desirable residential district, but business interests have been slowly encroaching upon the territory, and in order to get a proper rental from the building, it was necessary to remodel it for office purposes. In order to accomplish this, the first floor of old dwelling houses was removed and the ground floor of the new building was laid out three steps below the street level, the new first floor being arranged a short flight above the pavement. In this manner an extra story was gained which brings in very desirable revenue.



THE BUILDING AFTER ALTERATION

ALTERATION TO BUILDING AT 1309 LOCUST STREET, PHILADELPHIA, PA.

C. A. ZIEGLER, *ARCHITECT*



BUILDING AT 208 SOUTH THIRD STREET, PHILADELPHIA, PA.
ALTERATIONS BY C. A. ZIEGLER, *ARCHITECT*

XUM

Washington Monument, Baltimore, Md.

(See reproduction of original drawing by O. R. Eggers on opposite page)

BALTIMORE'S title as "The Monumental City" is derived less from the number of its monuments than from the early date at which the Washington Monument in Mount Vernon Place, Baltimore, was erected.

This stately shaft rises 164 *feet and is surmounted by a heroic figure of General Washington. The monument was built in* 1815. *Of the many monuments of Washington erected all over the United States none is more dignified or has a finer setting than this one.*

The citizens of Baltimore, with a true sense of the artistic, have completed a scheme for the development of the Mount Vernon Place section, and in this scheme the Washington Monument will become the dominating feature. The plans for this dignified city development, as worked out by Thomas Hastings, architect, will be found in THE AMERICAN ARCHITECT, *issue of January* 16, 1918.

THE WASHINGTON MONUMENT, BALTIMORE, MD.
THE AMERICAN ARCHITECT Series of Early American Architecture

EDITORIAL

Architects' Registration Laws

IN this issue Mr. D. Everett Waid, long identified with the idea of proper registration laws for the architectural profession, presents in admirable form the whole case against joint registration boards of architects and engineers.

Reduced to the most simple terms the argument is that the scheme does not work. A convention of members of state registration boards representing twenty-six states declared by unanimous vote that joint registration boards are not desirable for the best interests of either profession. Six months later another convention of the same officials reaffirmed, also unanimously, the resolution adopted by the first convention. This should carry great weight, for the action was taken by the men best qualified to judge as a result of actual experience.

On first thought it seems a most desirable and practicable thing to regulate under one act the practice of architects and engineers who work together on one great structure whether it be the Woolworth Tower or Brooklyn Bridge.

It may be admitted that the architects should be stronger in construction and that engineers should learn more respect for aesthetic treatment of their work. At the same time each profession, while having much in common with the other, requires so much knowledge and training which are distinct and beyond the other profession that it is absolutely impossible for architects to pass upon engineers or engineers to pronounce judgment upon the qualifications of architects.

If architects and engineers are members of one board and both are required for a quorum, the situation is absurd and illegal, and a waste of time.

Boards of examiners for engineers have problems quite sufficient to tax the ability and time of the most competent. They must cover a wide field when preparing and conducting examinations for structural engineers, sanitary, electrical, mechanical, chemical, civil, and more besides. Architects have a wide field of their own to cover and it will certainly be difficult to induce practicing architects of standing to accept appointments and serve on Registration Boards if they must spend time outside of that required to pass upon their own profession.

By all means let us have co-operation between the professions and avoid for all time the trouble which occurred some years ago in one state. (Now Illinois has parallel laws for the two professions.)

But architects and engineers should combine to oppose joint boards which will result in throwing the membership of boards of examiners into the control of grafting politicians.

The Philadelphia-Camden Bridge

PHILADELPHIA, in order to meet its growing conditions and to provide more easy and modern methods of communication with adjacent sections lying on the banks of its rivers, proposes a bridge that will link together Philadelphia and Camden, New Jersey. There is unanimity as to the necessity for this bridge, but a very wide divergence of opinion as to just where it should be located.

The question of approaches looms largest. Both cities are so full of historic localities, and of these the citizens are so properly proud and watchful of their safety, that it is difficult to propose a site for an approach that will not at once call forth a flood of protesting letters to the daily press.

Protest is made of any location, particularly the proposed Washington Square site, that would mar the dignity of historically associated buildings. Philadelphia, like Boston or New York, is the custodian on behalf of all the people in this country, of their historic landmarks.

It is not pleasant to regard as possible agreement on a site that would make Washington Square the entrance point of the Philadelphia approach. On this square is Independence Hall, perhaps the most venerated shrine of American history. Desecration of this locality would be nothing but a crime. As it is today, Washington Square is a quiet, restful spot in a bustling city—a place where patriotic citizens may sit and ruminate upon the progress we have made as a nation since that memorable day when a group of earnest patriots signed the declaration of our national independence. Some day the city of Philadelphia, in co-operation with every state in the Union, will, if present plans mature, undertake to make this historic Square a purely national memorial. To locate a proposed bridge approach at that point would be to create a condition that would mar for all time the dignity of the neighborhood, and become a lasting reproach not alone to all Philadelphia, but to the nation as well.

REGISTRATION of ARCHITECTS and ENGINEERS

By D. Everett Waid

THE report of the Board of Directors of the American Institute of Architects contained a paragraph which was presented to and approved by the last convention as follows:

"The Institute has consistently stood for separate registration laws for Architects and Engineers and the Board still believes that wherever conditions make it possible separate laws are desirable. It recognizes, however, that in certain localities this may not be practicable and in view of such conditions, advises continuation of our co-operation with Engineering Council looking to the development of standard legislation with a view to the passage of laws that shall adequately recognize the independence of interest of the two professions and provide for that independent control of the practice of each profession by its own members that is essential to the satisfactory operation of such a law."

All architects and engineers who are promoting legislative registration should give the gist of this report careful study in order to avoid future difficulties for both professions. The point may be expressed as follows:

All joint registration laws should be opposed unless such joint bills are drawn upon a basis of providing common headquarters and clerical force but establishing separate boards or sub-boards of architects and engineers, each of which shall be independent of the other in administering its work of examination and registration.

That those architects and engineers who have in their charge prospective legislation cannot give too careful consideration to the details of this phase of co-operation between the two professions is emphasized by the action of the National Council of Architectural Registration Boards. At their convention in St. Louis, November, 1920, there were present thirty-eight delegates representing twenty-six states including members of different state boards of registration. They passed the resolution by unanimous vote: "That Joint Registration Boards are not desirable for the best interests of either profession."

THE convention of the same organization, held in Washington in May, 1921, reaffirmed the same attitude against registration.

Such a sentiment, coming as it did from men who have had to learn the difficulties and defects of existing laws from the close study necessitated by their experience in administering those laws, is significant. It means that they share in the general desire that the two professions shall strengthen each other by cordial co-operation and shall eliminate all reasons for a clash of interest,—false as those reasons are. It means at the same time that they regard registration laws as having for their chief purpose crystallizing and raising the standard of qualifications for practitioners.

It means also that they have found the actual work of administering registration laws so laborious and painstaking that each profession has its hands full solving its own problems, fixing its own peculiar standards, examining its own candidates. It means in short that one board of examination and registration is too busy with its own profession to undertake to do the work of two professions when their educational requirements differ so widely as must those of architects on one hand and those of chemical engineers, electrical engineers, and surveyors, on the other.

Altruistic co-operation is admirable if it is not undertaken in an impracticable way and so made ineffective. It is even conceivable that one composite board of engineers and architects made up of superior men full of cordial good intentions, may apparently succeed for a time. But that success is the more dangerous for the future inasmuch as it does not safeguard against certain possibilities of a change in personnel, of individual jealousies and of political influence.

The spirit of the report of the Directors and of many actions taken by the Institute and its officers during a series of years is that of cordial co-operation with the engineering profession. Architects and engineers should indeed co-operate most effectively when working together to secure the enactment of parallel registration laws.

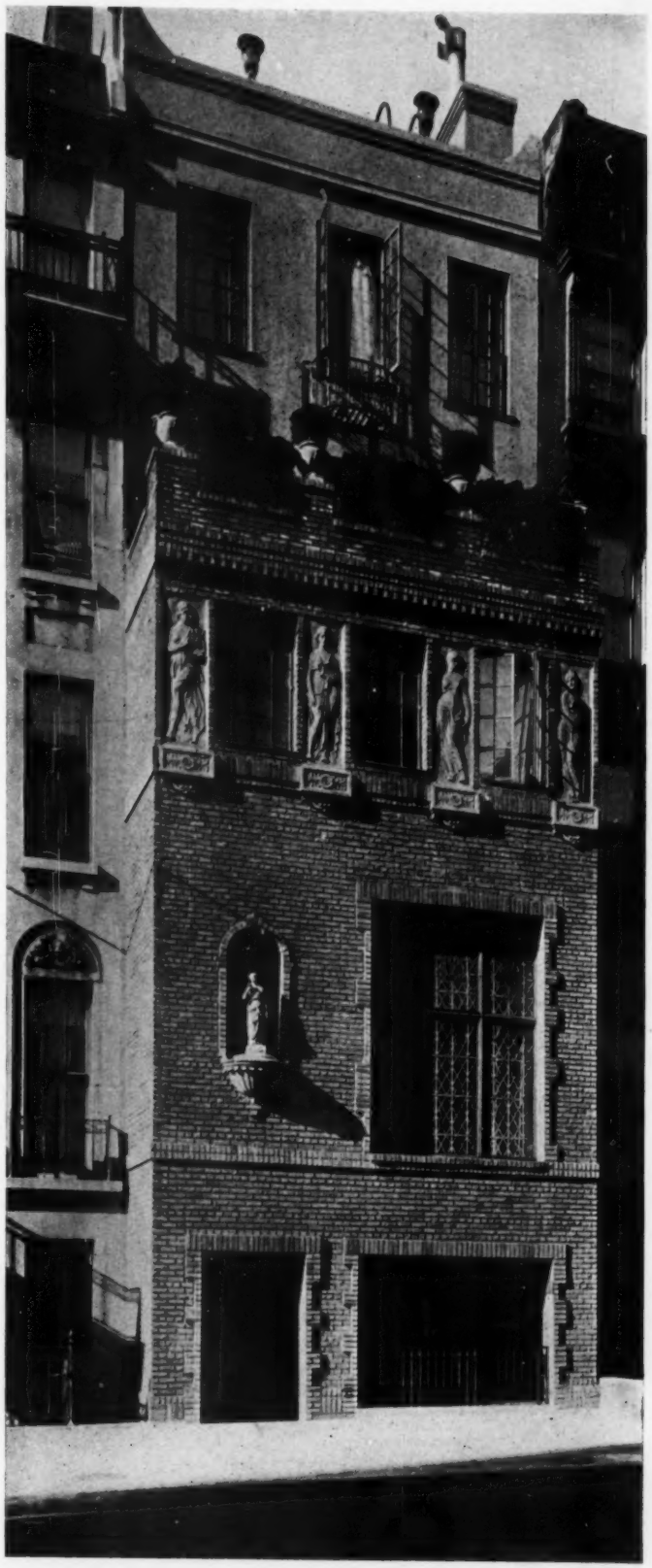
The Board of Directors should also encourage Chapters (even those who have no legislation of their own in prospect) to aid engineers who may happen to be trying to secure registration laws for themselves.

THE wisdom of the Institute in declaring for co-operation and separate laws rather than joint laws, may be demonstrated when the real test comes. Already one particular difficulty inherent in the sort of joint laws so far enacted is revealed by a striking illustration. One architect member of a joint board has been present at meetings which have passed upon the qualifications of 900 engineers. He, the architect, had no voice in considering the engineers, but he was required to be present to make a quorum. It was an ordeal for a busy man to kill time at so

(Concluded on page 16)

THE building shortage in this country during the past two years produced some interesting problems and equally interesting solutions. In this issue Mr. Ziegler, of Philadelphia, has written of alterations of old city houses into office buildings. Mr. Totten, of Washington, has contributed interesting pictures of his house and gardens. Through the courtesy of Mr. Harry Allan Jacobs there is here shown a fine solution of the combination of an architect's offices, his city home and the utilization of additional floors as small apartments rented to a selected tenantry.

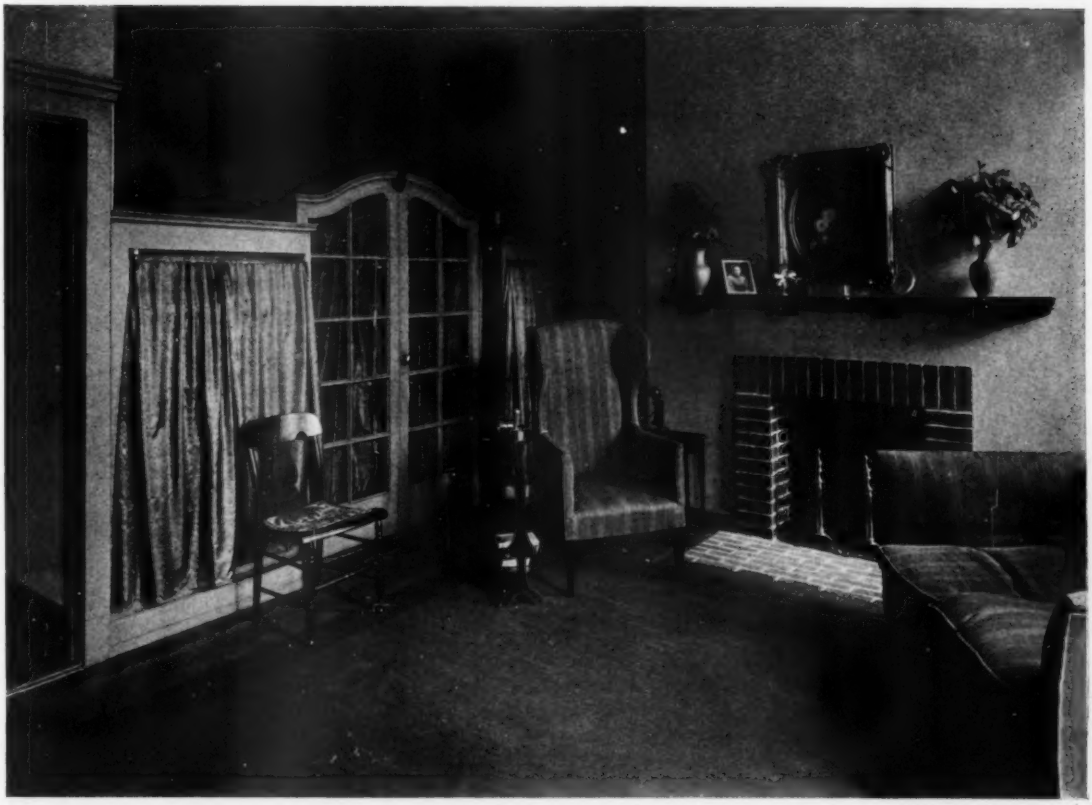
IN its exterior and interior Mr. Jacobs' house shows in every detail the artistic refinement of the well trained architectural mind. The house stands out among its neighbors as a picturesque detail. In its interior there are to be found splendidly worked out wall textures, skilfully handled woodwork. The decorative features, marked by a well considered restraint, are mainly contributed by paintings, rare old furniture, fine rugs and ornamental iron work. The drafting room is splendidly lighted and is a commodious, conveniently appointed working place.



BUILDING, 64 EAST FIFTY-FIFTH STREET, NEW YORK
COMPRISING ARCHITECTS' OFFICES, DUPLEX AND SINGLE APARTMENTS
DESIGNED AND ERECTED BY HARRY ALLAN JACOBS, *ARCHITECT*

XUM

AN APARTMENT LIVING ROOM



AN APARTMENT LIVING ROOM

BUILDING, 64 EAST FIFTY-FIFTH STREET, NEW YORK
COMPRISING ARCHITECTS' OFFICES, DUPLEX AND SINGLE APARTMENTS
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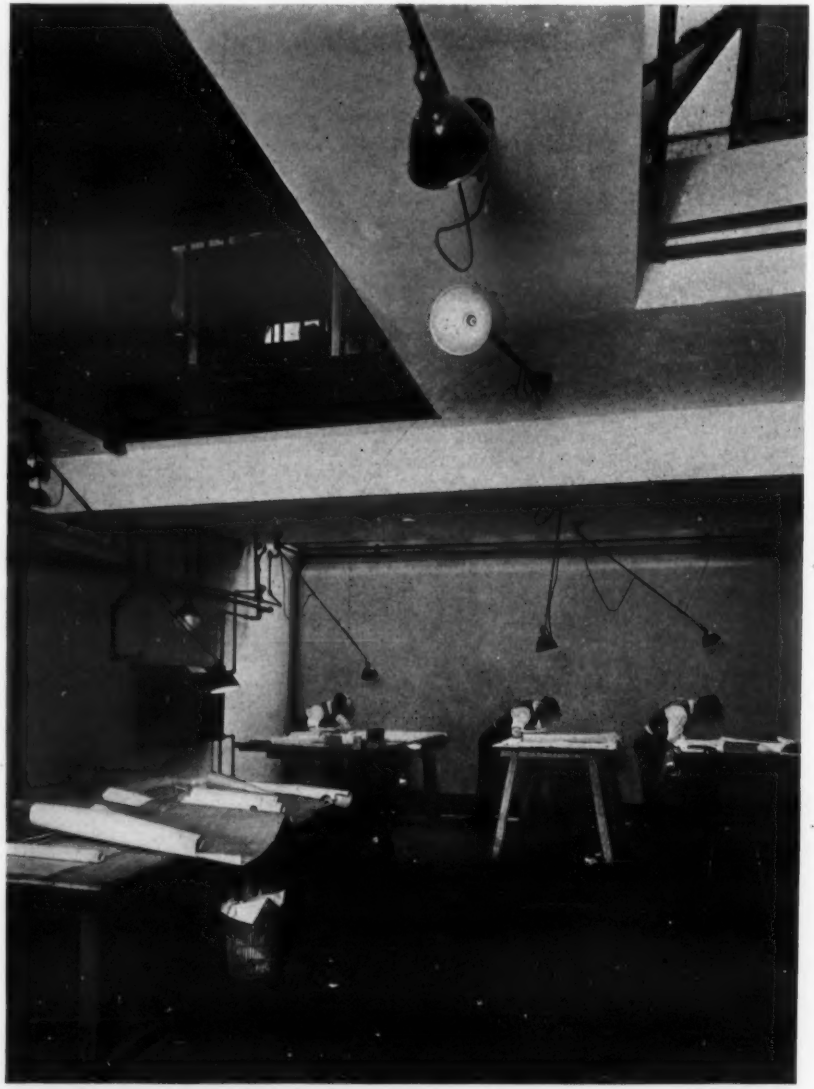


THE DRAFTING ROOM

MR. JACOBS' OFFICE

BUILDING
64 EAST FIFTY-FIFTH STREET
NEW YORK

COMPRISING ARCHITECTS' OFFICES, DUPLEX
AND SINGLE APARTMENTS

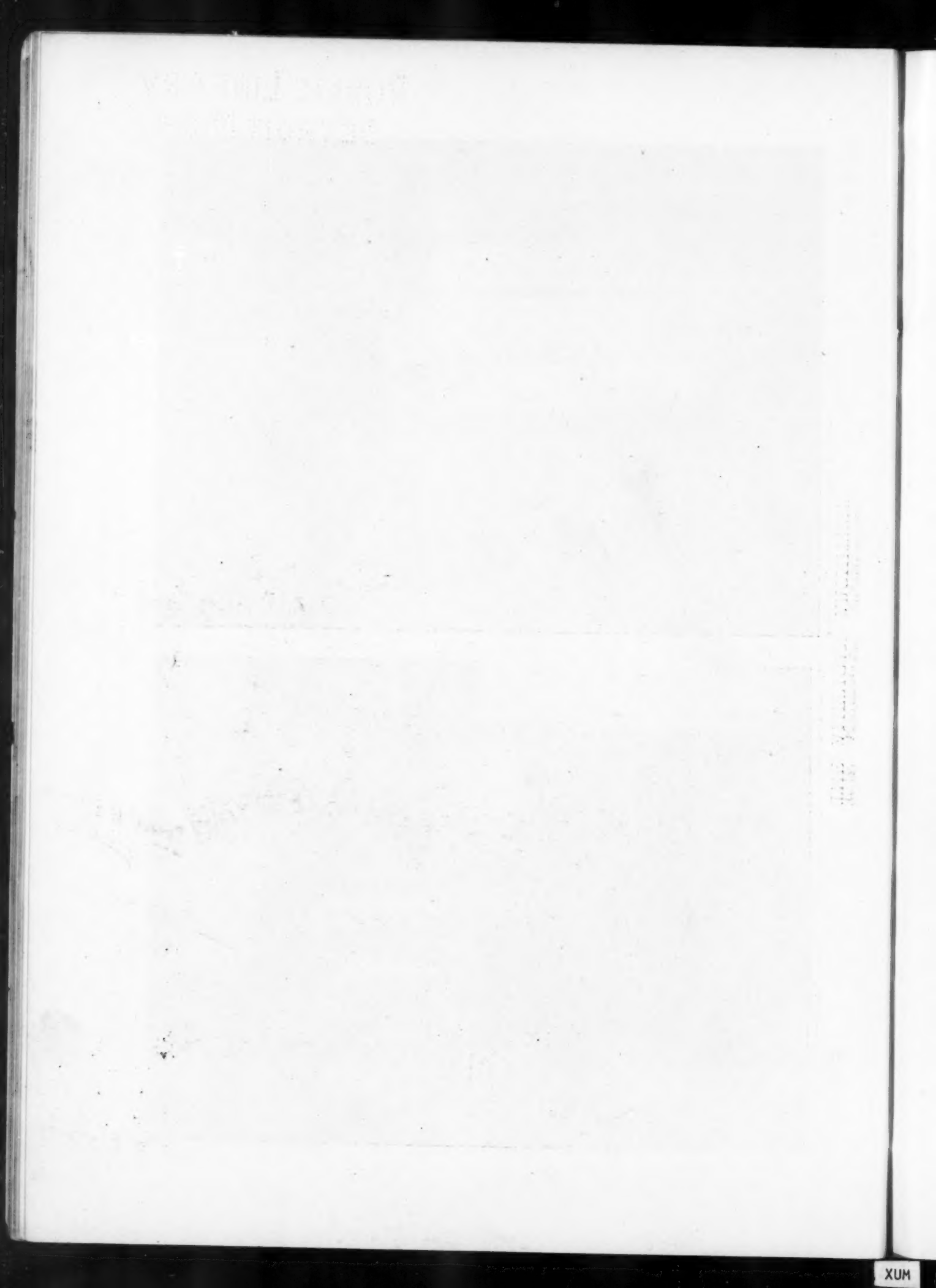
DESIGNED AND ERECTED BY
HARRY ALLAN JACOBS, *ARCHITECT*

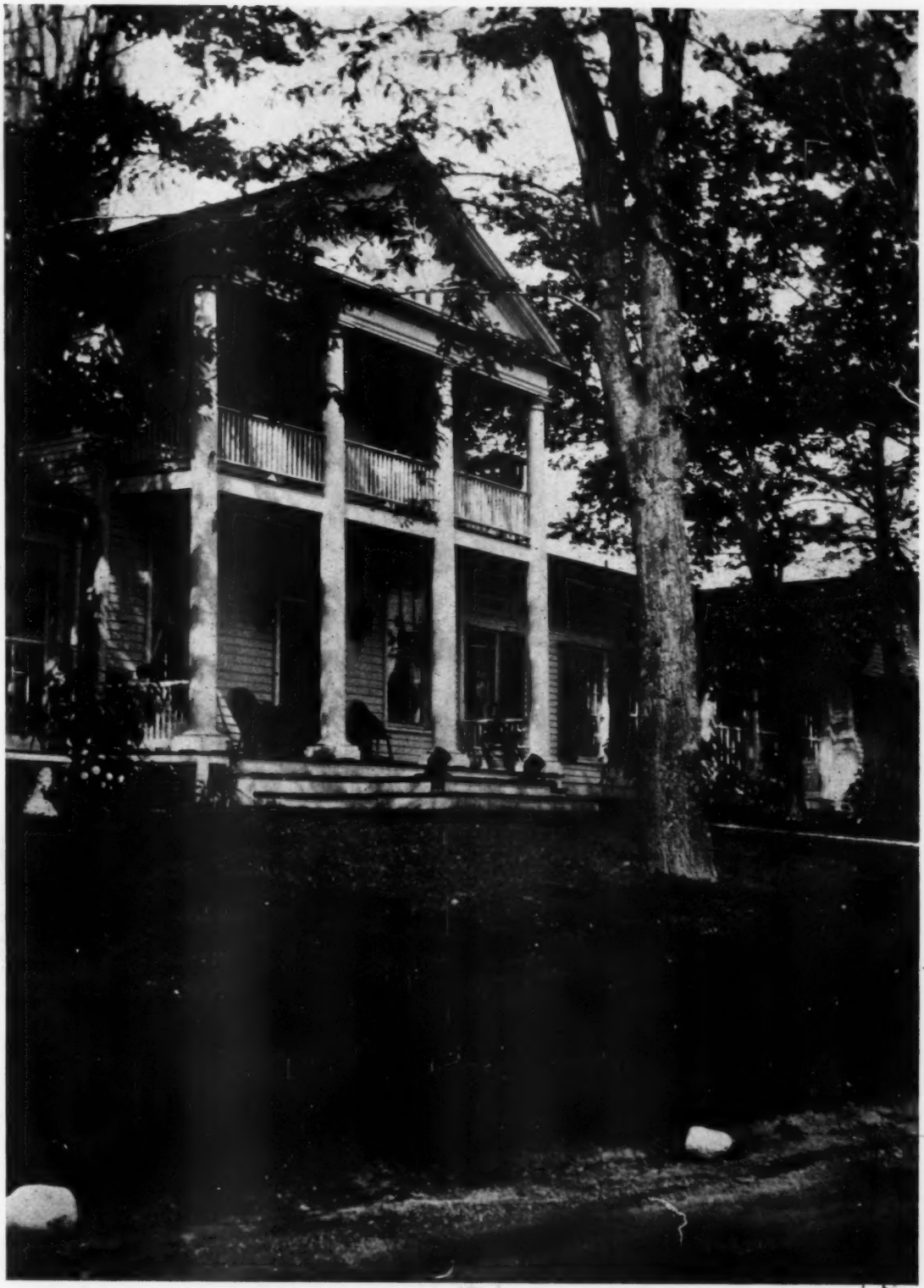
A DUPLEX APARTMENT

AN APARTMENT LIVING ROOM

BUILDING, 64 EAST FIFTY-FIFTH STREET, NEW YORK, COM PRISING ARCHITECTS' OFFICES, DUPLEX AND SINGLE APARTMENTS

DESIGNED AND ERECTED BY HARRY ALLAN JACOBS, *ARCHITECT*





HOUSE OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*

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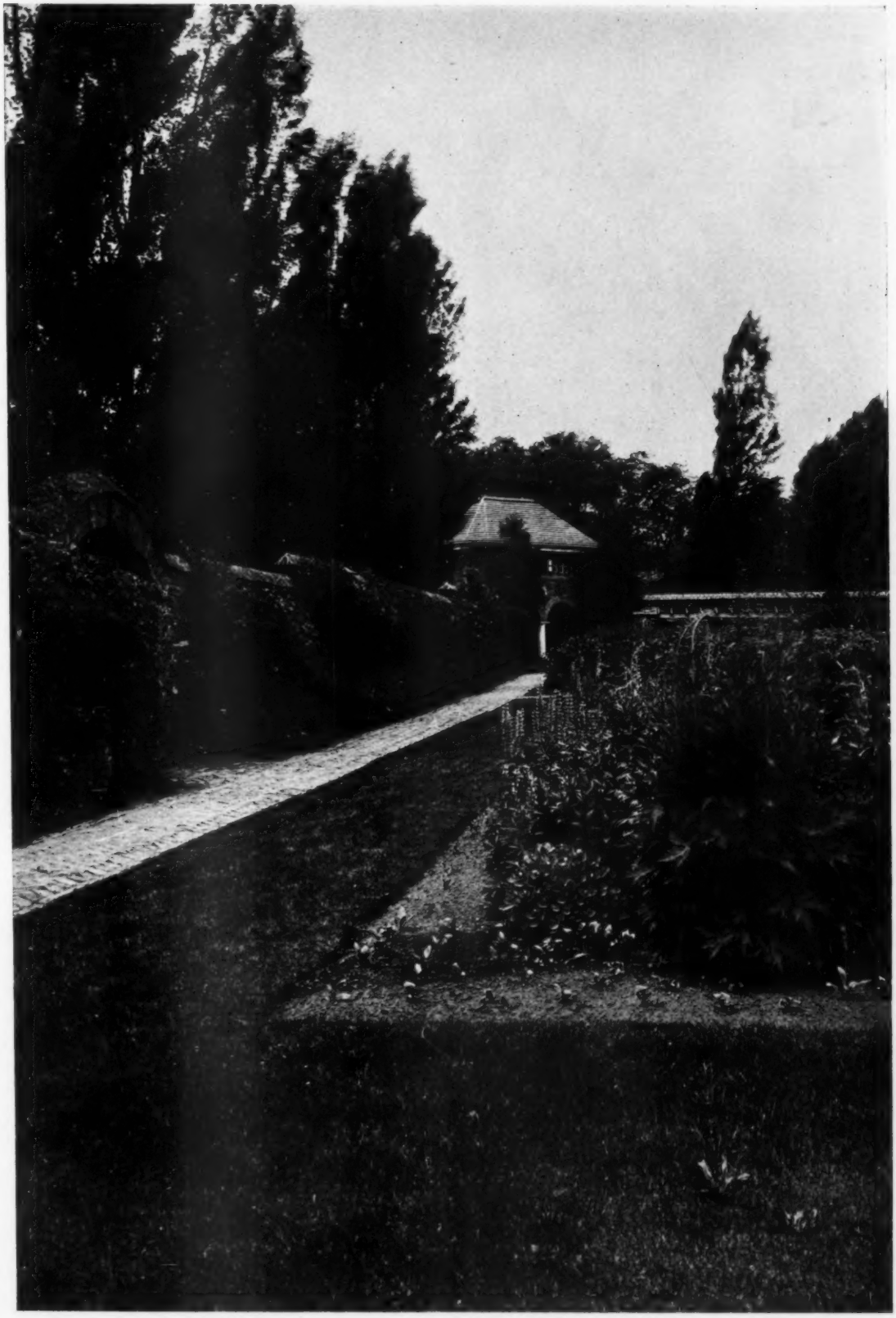
HOUSE AND GARDEN OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*

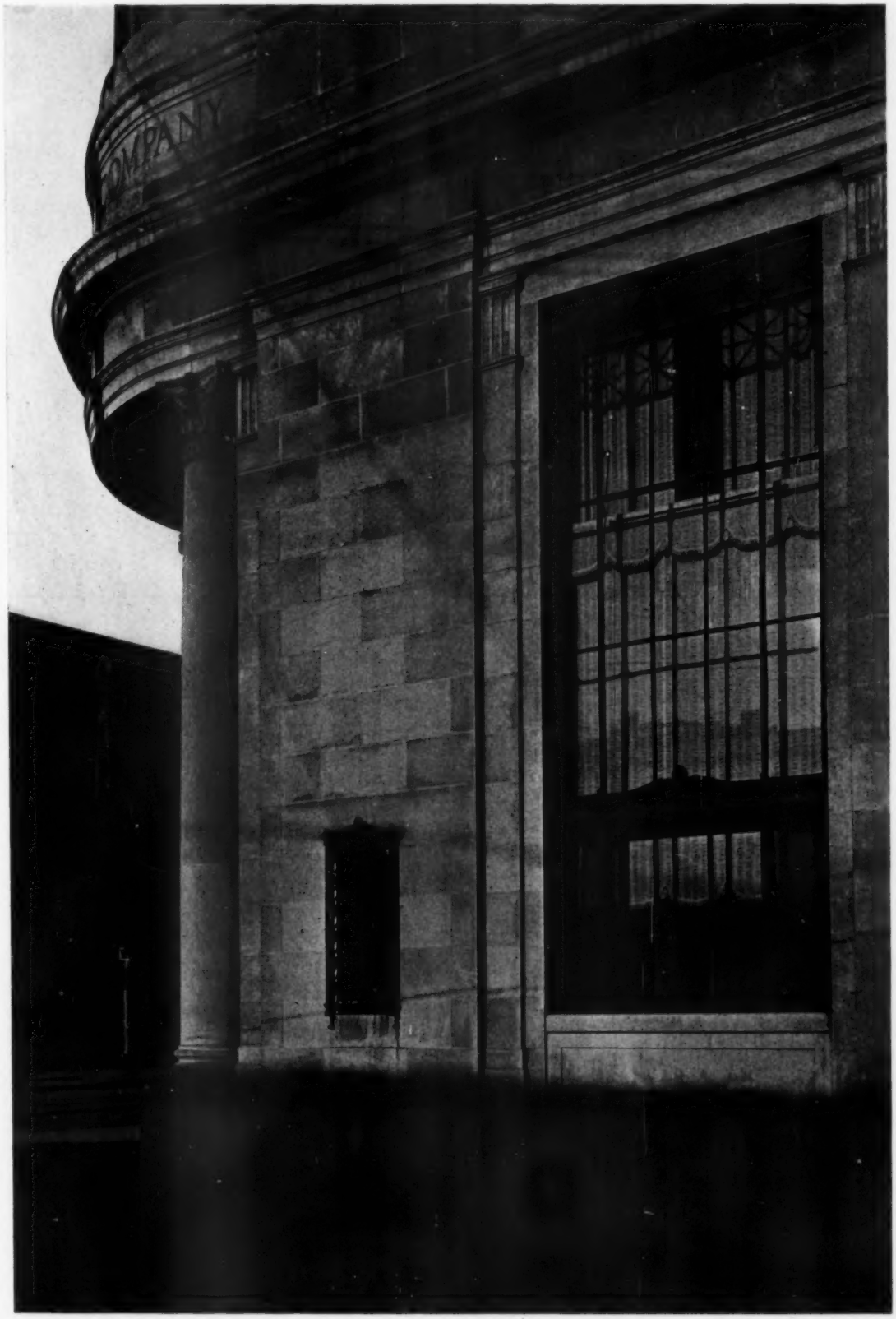
XUM

TWO GATEWAYS IN GARDEN OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*



GARDEN OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*

BUILDING FOR PEOPLES TRUST CO., TAMAQUA, PA.
TOOKER & MARSH, *ARCHITECTS*



EXTERIOR DETAIL

BUILDING FOR PEOPLES TRUST CO., TAMAQUA, PA.

TOOKER & MARSH, *ARCHITECTS*

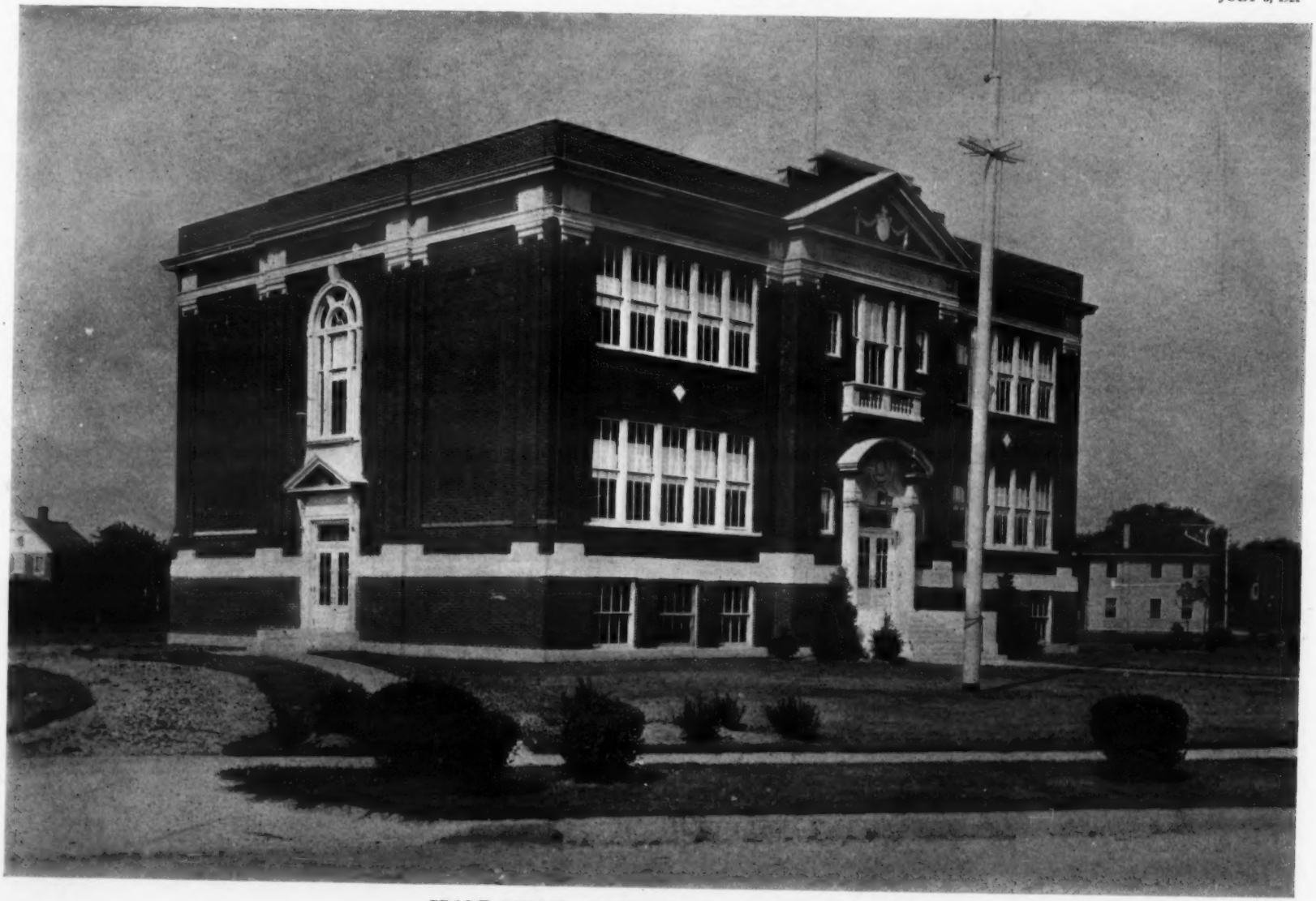
XUM

INTERIOR DETAIL

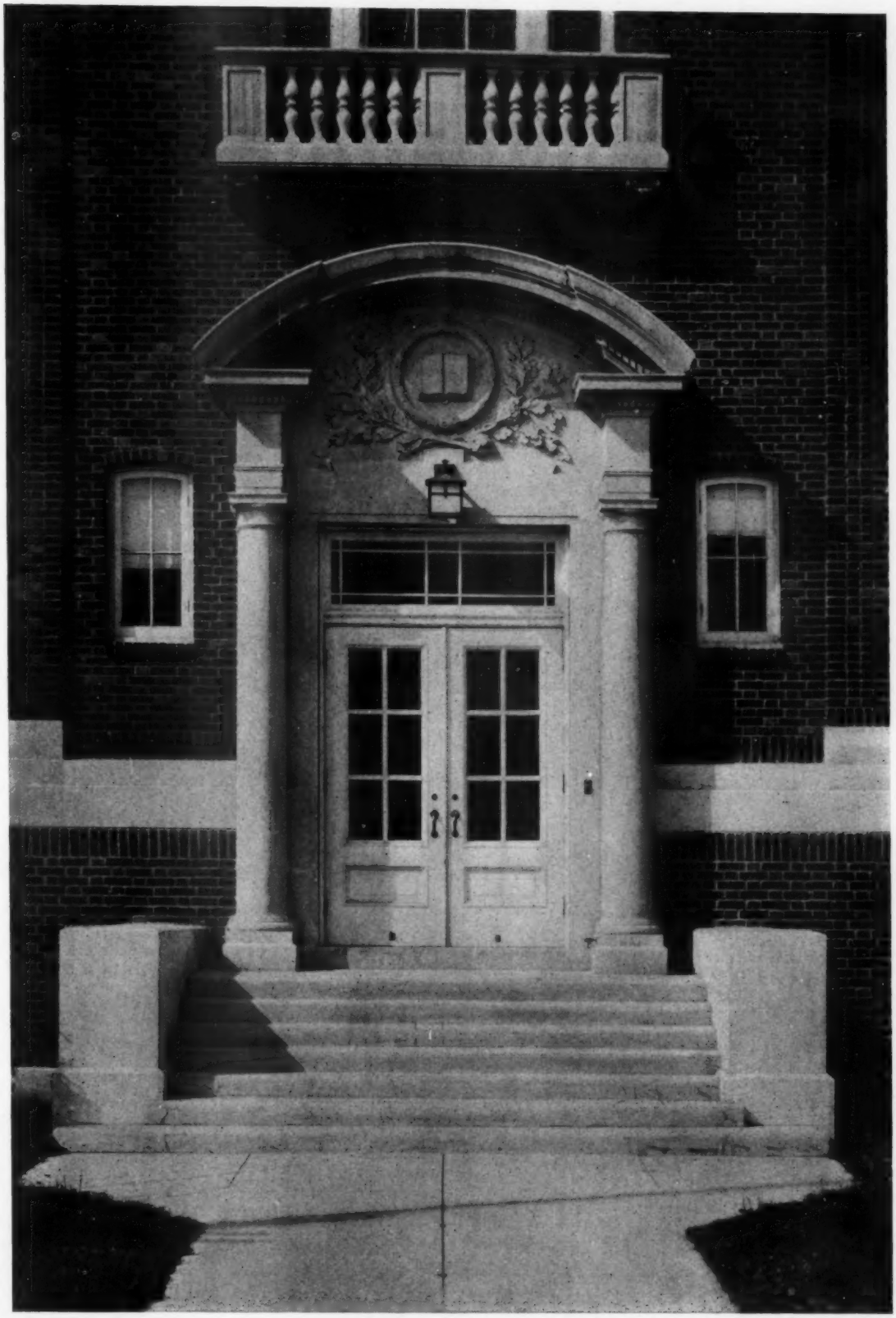
BUILDING FOR PEOPLES TRUST CO., TAMAQUA, PA.

TOOKER & MARSH, *ARCHITECTS*

TREASURER'S OFFICE BUILDING, SUFFOLK COUNTY, NEW YORK
TOOKER & MARSH, *ARCHITECTS*



GRADE SCHOOL, BALDWIN, LONG ISLAND, N. Y.
TOOKER & MARSH, *ARCHITECTS*



DETAIL OF MAIN ENTRANCE
GRADE SCHOOL, BALDWIN, LONG ISLAND, N. Y.
TOOKER & MARSH, *ARCHITECTS*

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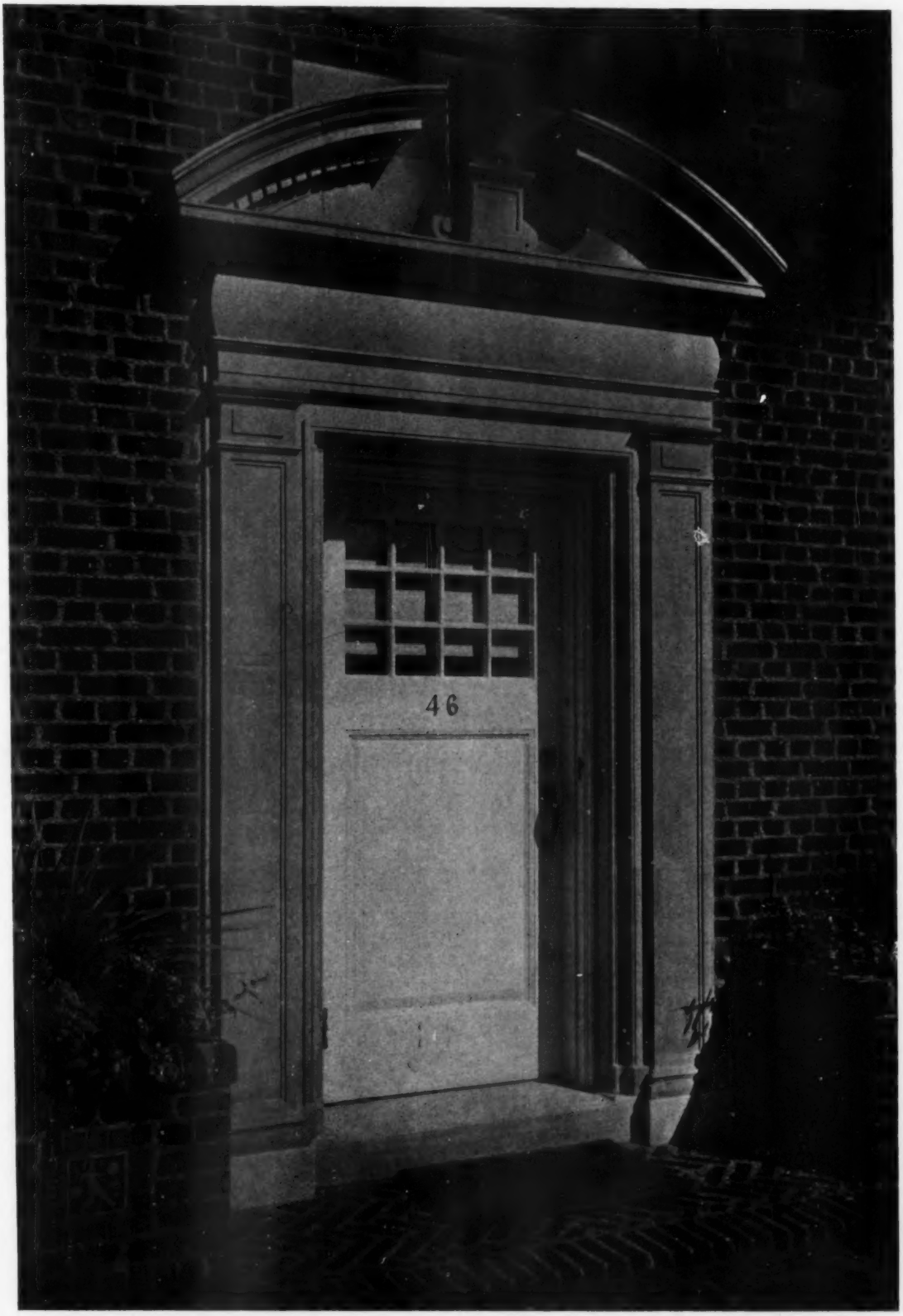

DETAIL OF DOORWAY
HOUSE OF CHARLES OTTO, ESQ., HARTSDALE, N. Y.
TOOKER & MARSH, *ARCHITECTS*

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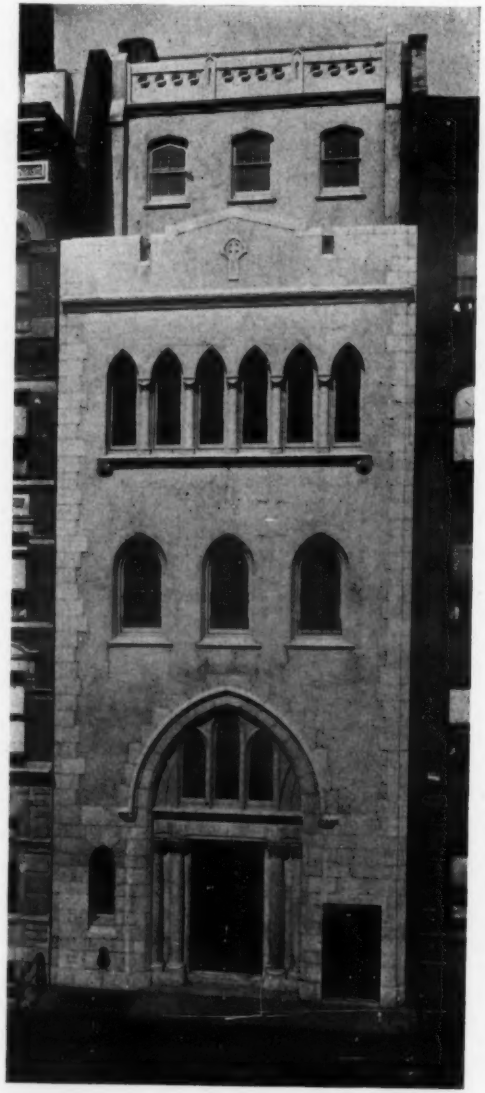
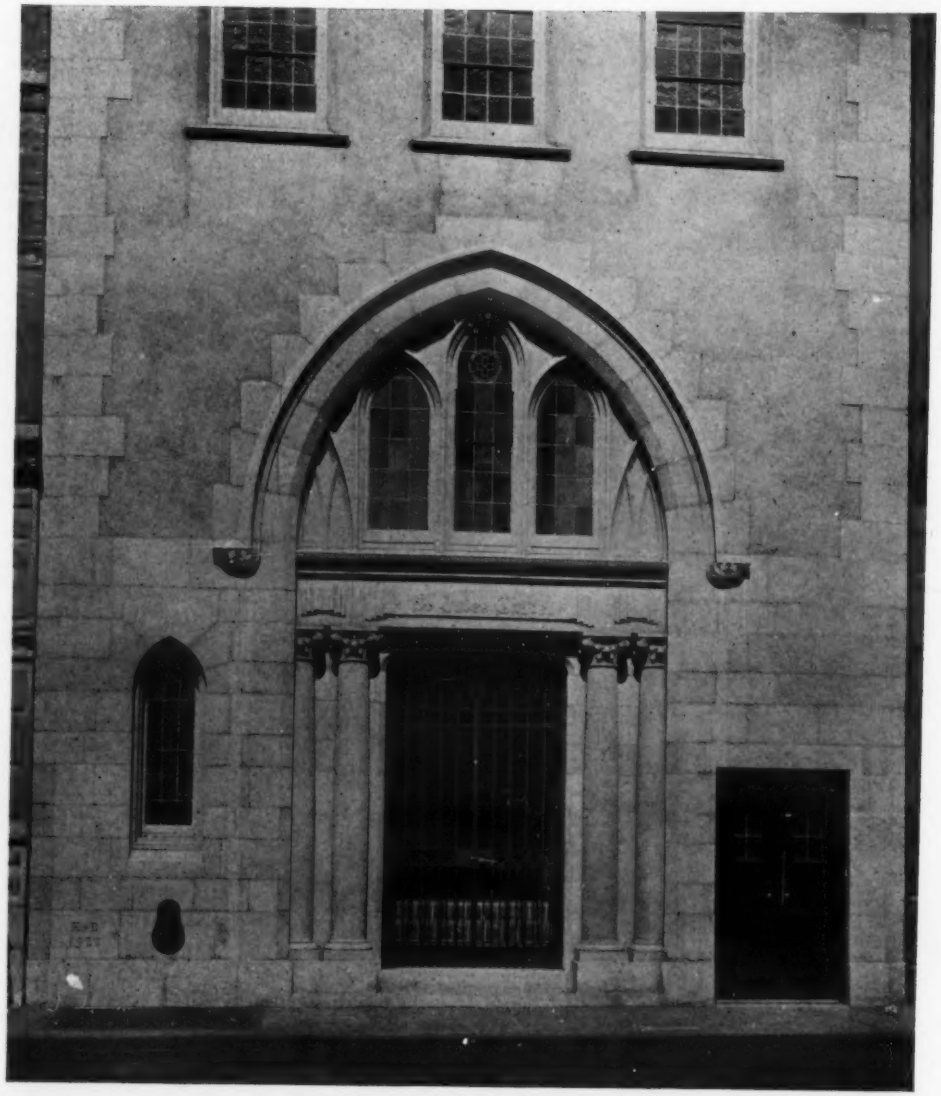




ST. JUDE'S CHAPEL, 19 WEST NINETY-NINTH STREET, NEW YORK
LUDLOW & PEABODY, *ARCHITECTS*

BUILDING AT 132 SOUTH FOURTH STREET, PHILADELPHIA, PA.
ALTERATIONS BY C. A. ZIEGLER, *ARCHITECT*

Registration of Architects and Engineers

(*Concluded from page 14*)

many meetings but dutifully he did it and was actually present to make the quorum while the records of 900 engineers were reviewed.

If a legal quorum is *three*, can two do work lawfully with a third present powerless to vote? If experienced board members think that five architects on one board are desirable, and at least three architects unanimous upon each judgment are essential,—is it sensible to allow two to make such decisions?

The practical difficulties and dangers confronting joint boards are bound to become more and more apparent with further experience.

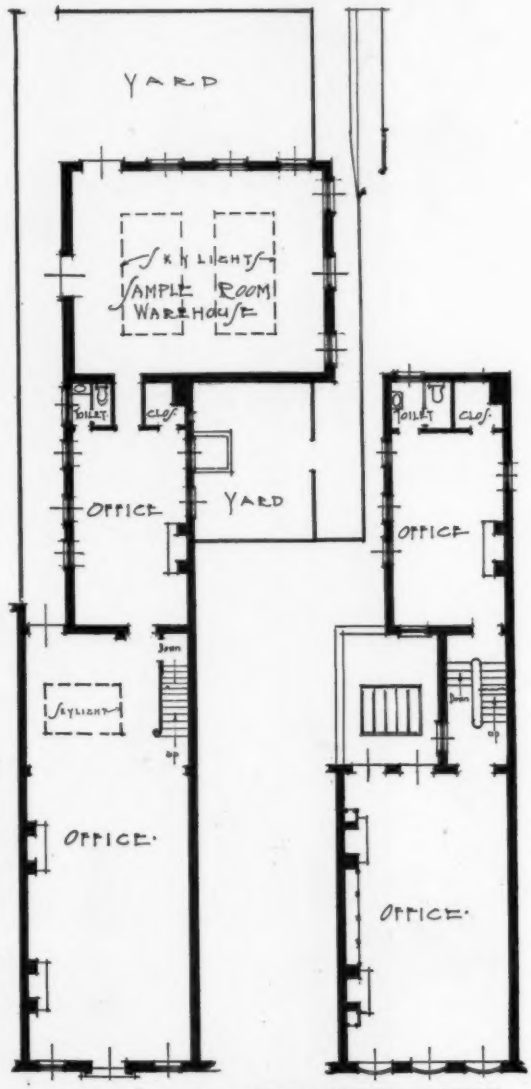
Architects' Offices Solving High Cost of Rent

(*Concluded from page 9*)

At 1309 Locust Street, Philadelphia, the problem was a larger one. The building is situated one square from Broad Street, which is the largest boulevard of the city and was until recently a very desirable residential district, but business interests have been slowly encroaching upon the territory, and in order to get a proper rental from the building, it was necessary to remodel it for office purposes. In order to accomplish this, the first floor of old dwelling houses was removed and the ground floor of the new building was laid out three steps below the street level, the new first floor level being arranged a short flight above the pavement. In this manner an extra story was gained which brings in very considerable revenue. The owner secured by the alterations five floors of desirable office space, all well lighted and ventilated, which he was able to rent profitably at a much lower rate than is charged by the average office building, and in addition he is reaping a very considerable appreciation in the value of his property, which is in the heart of the Philadelphia business district and therefore certain to become of much greater value as the normal development of the city continues.

The alteration to this building represents the maximum that can be done in the conversion of a dwelling house, as every foot of floor space is utilized for office purposes with the exception of a small portion of the old cellar, which is retained for the heating system, and yet very little was done to alter the structure of the old building. The front was not torn out in this case, but new windows, larger than the old ones, were put in the old wall, and the entire surface was covered with "Color-tone Stucco," made by the Atlas Portland Cement Company, which gives a very agreeable texture to the front.

Many of the interior partitions were torn out and the stairway rearranged, but the general construction stayed as it was. A fire tower was added to the rear of the building to meet the requirements of the building law and in all probability the building will continue to be an asset to the owner until it is absorbed into some larger building project, which is the usual future for a property of this kind.



BUILDING AT 132 SOUTH FOURTH STREET, PHILADELPHIA

All of the buildings illustrated were formerly liabilities rather than assets, but immediately after alterations no difficulty was found in securing tenants; in fact, the owner of one of the properties disposed of it in less than six months after the alterations were made, at a very considerable profit.

DEPARTMENT of SPECIFICATIONS

The Specification Writer

A STUDY and analysis of those qualities a specification writer should possess, his habits of thought and study and the course he should pursue constantly, in order that he may ever be "up to the minute" in all the details of his work, is quite essential to the correct understanding of specifications and their production. The specification writer must be known, in his office, as a compendium of information relating to all productive, executive, and constructive processes of the organization. He should keep in intimate contact with all its activities and be prepared to give advice that possesses the stamp of authority, gained through knowledge and good judgment. To do these things the specification writer must have a broad education and should be a student of current art and technical—more especially engineering—books and periodicals.

It is of great advantage to the specification writer to have a university education, this training consisting mainly of engineering subjects with a sufficient amount of study in design, proportion and related aesthetic subjects to give proper balance to the other studies. It is unfortunate that architectural universities devote so little attention to the earnest consideration of specifications as one of the essential fundamentals of correct construction. As it is, under present curricula, it is quite customary for the student to gain the impression that specifications are anathema, a necessary evil that is so difficult to understand that it does not admit of clear and concise instruction. It is to be hoped that the future will see a more thorough method of collegiate instruction in specification writing.

Some of the most important subjects that must be studied, whether in the university or later, are rhetoric, composition and what has been termed Engineering English. The specification writer cannot hope to produce a clear, concise and logical specification unless he understands the technic of writing, although it is by no means necessary that he be a purist. It will be found that the habit of thinking and expressing thoughts in a logical and understandable manner will result in a more careful handling of specification problems through the tendency to consider and analyze all details in a similar manner connected with the work.

IT is probably true that more disputes, unhappy situations (unhappy for the architect) and failures to achieve the success rightfully due the designer and constructor of the building are directly traceable to the neglect, on the part of the specification writer, to express his desires and instructions in a clearly understandable manner than to any other cause. Such an apparently innocent thing as the transposition or omission of a comma, or of a word, may introduce ambiguity and place the architect in the position of requiring work or material that he knows is incorrect or unsuitable for the purpose intended. Aside from the serious financial consequences of such an error the architect is made to appear in a most ridiculous light and quite often he finds he is held in such contempt by those who have suffered because of his error that it is quite difficult for him to handle subsequent operations on the work with the sure-footedness so essential to leadership.

After he has ceased his university studies the specification writer should pass through all the positions in an architect's drafting organization, devoting several years to general drafting work, design, engineering calculations and detailing in large scale. This training is necessary so that the drawings may be understood from the draftsman's point of view and so that the specifications may be written to cooperate with them from the start to the finish of the work.

After several years spent in the drafting room the specification writer will find that supervision of construction work will open his eyes to many things he did not understand clearly or was not familiar with when working on drawings. This work will acquaint him with the methods of fabrication of work in the field, its construction and installation and will enable him to visualize, in true perspective, the delineations of the drawings and the descriptions he wishes to place in the specifications. In addition to these advantages this work will give the specification writer opportunity to study the habit of mind of the contractors, foremen and workmen, will reveal to him the written and unwritten rules of the labor unions and building inspectors and will enable him so to draw his specifications that friction with the human element will be reduced to a minimum.

Field supervision will show how the drawings and specifications should be prepared so they may be coordinated in a manner logical to their use on construction work. The installation of work that has been the subject of shop drawings, approved in the architect's office in the customary manner, will bring to the attention of the specification writer certain matters and things that must be considered when

preparing the general drawings and specifications and when approving the shop drawings of the contractor.

A GOOD training can be gained in two or three years of construction supervision, after which the specification writer should return to the office organization and enter the executive work of the office. He should become familiar with all details that must be given attention after the drawings and specifications have been completed, interesting himself in the securing of bids and their tabulation for presentation to the owner and be prepared to discuss them in an intelligent manner. He must make awards of contracts, prepare the necessary contract agreement papers and, in every way come to understand all steps in the progress of the work after bids are solicited. When construction work has started the attention of the specification writer must be directed to the full size details, making sure that the drafting room supplies these in regular sequence, so as not to delay the preparation of contractors' shop drawings and so that, wherever necessary, detail explanations of intricate or unusual features, merely indicated on the general scale drawings, are supplied. When the shop drawings begin to arrive in the architect's office they must be given proper attention, making sure that all requirements of the drawings and all provisions of the specifications have been adhered to or that good and sufficient reasons have been advanced for variations the shop drawings may show.

Perhaps simultaneously with the preparation of full size detail drawings, but most certainly shortly thereafter, the question of the selection of materials, in cases where the specifications have granted the architect a choice, and the approval of samples of materials the contractor is to furnish, must be given attention. Great care must be given this work, to make sure that superficial impressions of an article that has been submitted as an alternate to that which has been specified do not cause the approval of an article lacking merit. The general knowledge of the specification writer, gained in the university, office and field must be depended on to supply the grounds for the acceptance or rejection of submitted samples strictly on the basis of intrinsic value, adaptability to the use to which it will be put and permanency after installation. Adherence to the provisions of the contract documents must be the ruling factor, unless, as suggested above, there are very good reasons otherwise. It is presumed that the decisions of the specification writer or drafting room, as expressed in the specifications or on the drawings, have been the result of extremely careful consideration of the problems involved. Of course, at times specific decisions are reserved until after it is known the building is to be constructed as designed but generally the decisions, once having been made, should not be changed except where absolutely necessary.

AFTER construction work has progressed beyond the excavation stage attention should be given the reports of the field superintendents so that material that may hold up the rapid progress of the work may be followed up in the shop to insure its prompt delivery. Occasional visits to the operation will assist the specification writer in general supervision of the work so far as his specifications are concerned and refresh his mind with respect to the practical aspect of the work. Discrepancies and ambiguities that are not apparent when read in the office stand out as if printed in bold faced type when a keen-eyed contractor's superintendent calls attention to them. Such errors should be admitted unequivocally, so that the respect of the contractor may be maintained and to gain his co-operation, rather than opposition, in their correction. This spirit of fair dealing should obtain at all times, not only in the field but in the preparation of the drawings and specifications as it will lead to more complete unity of purpose between the architect, owner and contractor.

The description of the duties of the specification writer, as given herein, contemplates a broadly educated, broad-minded man who is thoroughly competent to supervise the activities of construction work because he knows from personal experience how each step is accomplished. It is not necessary that he personally attend to all details, but he must have supervising control, under direct authority of the architect, of all executive duties pertaining to the constructive processes.

The specification writer should have charge of the drafting room, with a chief draftsman who is directly responsible to him in the preparation of drawings. This supervision is urged as the logical source of authority on the assumption that the specification writer, because of his education in all branches of the office and field organizations and his familiarity with the many problems that must be successfully met is the more competent. If the chief draftsman has the training the specification writer should have it is very probable he will merge the duties of the specification writer with those of his own. This is the method of organization pursued in many offices and cannot be condemned except on one point. That point is, a chief draftsman should devote all his energies to detail supervision of the drafting room while the specification writer should devote his energies to specifications. These duties can not properly be assigned to one man except in those offices where the attention of each man must be given to his own special work half the time. Under such conditions this arrangement is effective and, perhaps, ideal. Nevertheless it leads to the conclusion that, after

all, the specification writer should control the production of drawings and specifications and not the chief draftsman.

THROUGHOUT the years of preparation it is necessary to pass before assuming the duties of writing specifications, and what is of greater importance, after having assumed those duties, it is quite essential that current technical magazines and books be read conscientiously. The magazines frequently contain items of interest, such as reports of tests of materials, descriptions of processes found adaptable to certain difficult methods of construction and data with respect to the successful or unsuccessful use of comparatively new materials and methods.

The technical books are of great value because of the wealth of information they ordinarily possess. Immediate points of interest in magazines and books should be noted and recorded in a permanent file while the general items should be read with the expectations that they may be found readily when future necessity requires their re-study.

The specification writer will find that careful reading of well-written editorials, technical articles and books will quicken his thought and give him greater facility in the writing of specifications in an understandable manner. This phase of the daily work can very well be given the time necessary to survey the current articles, notes being made of the items requiring thorough study at a more convenient time. An orderly study of what is being accomplished by others is the one inexpensive and readily available means of keeping abreast of the times and this the specification writer must do if he expects to progress and retain mastery of himself and of his work.

One of the most important attributes the specification writer should cultivate is that of being capable of analyzing the drawing to determine the scope of the specifications and what they must include. If the preparation of drawings is under the control of the specification writer he will have the means at his disposal readily to have them prepared in the way he requires so that the drawings and specifications may be made completely co-operative. However, even though this ideal arrangement prevails the analytical mind remains as essential as under less ideal organization of the office.

The specification writer must be so equipped mentally that, when looking at the blue prints, he will be able to visualize the drawings in perspective or in other words to think in three dimensions while the drawings present their detail in two dimensions. The mind must carry itself beyond the drawings to the building, how the many parts are to be constructed and what relation one item bears to another. It is not enough to look at a sectional elevation and see only what appears on paper. All other drawings must be memorized so thoroughly that when looking at the sectional elevation those parts of the building that would appear are logically brought to mind.

IT must be borne in mind that drawings necessarily cannot show—and should not show—except perhaps by indications, many things that are essentially subject matter of the specifications. The specification writer must differentiate between those things that the drawings should show in detail, what the specifications must include in detail and what either the one or the other may include merely by indication for more explicit explanations in the other documents. A mind trained to analyze the work with this object in view is a valuable asset for the specification writer to have as it renders his work of greater ease in accomplishment, gives a certain orderliness of thought with respect to the preparation and assembling of the specifications and gives greater assurance of a successful building operation.

Specifications are most frequently written when the drawings are nearing completion and after the major details of the work have been determined. These specifications will be given greater scrutiny by those interested in the work than many believe to be customary. They are presumed to be the instructions of the architect, conveying to him in understandable language of what the operation consists and how it is to be accomplished. The specifications form an important part of the entire contract documents and if they are prepared by a specification writer possessing a modicum of the attainments mentioned herein, the architect, owner and contractor may well feel assured that a successful building construction operation will ensue.

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DEPARTMENT OF ARCHITECTURAL ENGINEERING

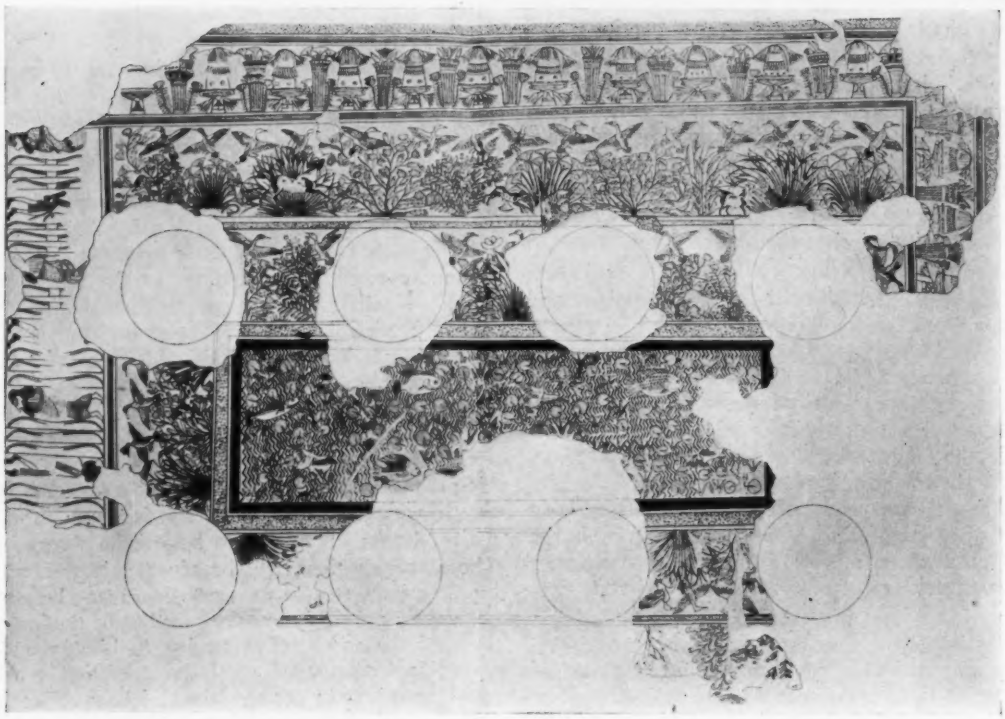

FIG. 1. WEST HALF OF PAINTED PAVEMENT, TELL-EL-AMARNA, EGYPT

THIRD ANNUAL CONVENTION of the NATIONAL LIME ASSOCIATION

THE National Lime Association held a convention in the Commodore Hotel, New York City, from June 14 to June 17, inclusive, the last three days being open sessions which the lime-using public was free to attend.

Some of the facts presented had a surprising interest for many of the visitors, who discovered, for example, that the amount of lime used in construction work is a rather small per cent. of all the lime used in the United States. Agriculture consumes a much greater per cent. and the general chemical uses of lime are on the increase. The report of Dr. Holmes, manager of the chemical section was most interesting. After listening to him the wonder is that the general public knows so little about this most important product. Has one ever stopped to think that when the oil wells of the world run dry and chemists begin to extract oil from the oil bearing shales that without lime, and lime in enormous quantities, it cannot be successfully done? Has one ever stopped to think of the importance of lime in the industries in which bleaching processes are followed?

Or of the medical uses of lime? The architect and engineer and contractor have often regarded the lime salesman with a pitying eye, wondering why the poor devil does not get into some other line because portland cement is so rapidly assuming vast importance in construction work. After attending a convention of the National Lime Association one has an itching

FIG. 2. ROMAN STUCCO-DURO, DETAIL OF PART OF A VAULT FROM A TOMB IN THE VIA LATINA, ROME

to buy stock in a lime kiln. The great rival of lime in the construction field is forgotten, until a lime manufacturer gently remarks that portland cement is two-thirds lime. The tone of the convention was optimistic and one fell unconsciously into the way of thinking of the lime men, who see with prophetic eye every foot of arable land some day covered with their product, every building full of lime in one form or another, the people eating lime-impregnated foods, the doctors prescribing lime-filled capsules, the automobiles buzzing around with lime-extracted oils.

Lime Mortar

THE ordinary text books tell us that limestone is a carbonate, which, burned in kilns to expel carbon dioxide and moisture, again hardens into a stone by absorption of carbon dioxide from the atmosphere. Sand is added to give bulk and furnish voids through which the air can get to the lime and harden it, the sand combining with the lime forming a sandstone. The books tell us that the process of hardening of lime is "desiccation," or a drying out. When a thin layer of lime mortar is put between bricks or stones the carbon dioxide in the air first in contact with the lime turns it into a carbonate and little by little the hardening lime on the outside shuts off the air supply to the interior. Finally the mortar to a depth of half to three-quarters of an inch is hard, and the mortar on the interior, lacking the proper amount of air, cannot harden, the small amount of moisture trapped within finally causing it to become friable. Even with the greatest pains taken to insure a plentiful supply of dry air to the lime on the interior of a wall, the process of hardening is very slow, sometimes taking years.

Moisture being present everywhere in the air proper desiccation is impossible, so hydraulic limes and cements, notably portland cement, all of which harden by the process of "hydration," have been supplanting ordinary lime. The advantage to the builder of being able to count on a mortar setting within one day and obtaining its final strength within thirty days is real, so that in these days of rapid building the fact that "hardening by hydration" is preferred to "hardening by desiccation" is not to be wondered at. The moisture in the air is a help and not a hindrance with mortars containing hydraulic lime or cement.

As illustrative of the instinct of cupidity in mankind, the lime manufacturers, although the construction industry takes only a part of their product, do not want to lose anything to the newer chemical products. They have a large staff of chemical research workers studying the matter of regaining supremacy in the building field. The president, Mr. Charles Warner, had the following to say about this in his annual report:

Quick Hardening Lime Plaster and Mortar

TAKE, for instance, the problem of developing the best type of quick hardening lime plaster and mortar. This question is of great importance to the construction field. It has been attempted more or less superficially and spasmodically by many manufacturers as well as in some of the past efforts of your association staff.

To get at this problem there are four major lines

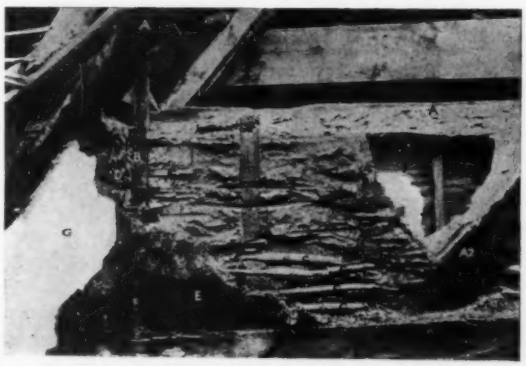

FIG. 3. FIFTEENTH-CENTURY WATTLE AND DAB, FROM QUEEN'S HEAD INN, DOWN, KENT

of study and research that have to be undertaken, and each of these four major divisions fans out into numerous sub-studies and minor researches to uncover any facts bearing on the main proposition.

The four major studies cover:—

First—The effect of burning, grinding and hydra-

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tion in various combinations and in conjunction with other ingredients to locate any refinement in manufacturing progress that may stimulate hardening in the finished product.

Second—The study of any hardening materials which of and by themselves and upon addition to lime will harden the mixed product. This covers the field of Portland Cement, gypsum, Keene's Cement and numerous other quick hardening products as additions to lime. Possibilities in this direction are but very slightly known and careful research work through a long series of tests is essential.

Third—Since carbon dioxide is the ingredient first naturally employed in the normal hardening of plasters and mortars, but limited by the slow effect and small quantity of this gas found in normal atmosphere, it becomes necessary to determine all materials, such as charcoal, which might absorb carbonic gas in quantity yet hold it so loosely that upon admixture with lime and water a quick release of the carbonic gas would produce rapid carbonization and hardening through the mass. There are many materials which can hold carbonic gas in this fashion, but their various effects and manner of action in combination with lime products must be throughly investigated through laboratory studies and practical application.

Fourth—In chemistry we not infrequently find materials which in small quantities added to some other product will cause that other product to take on entirely new chemical and physical characteristics. It is within the bounds of possibility that we can locate among the numerous chemical compounds, such a material which upon addition in small quantities to lime will immediately establish in the lime an entirely new hardening characteristic and solve our problem in that fashion. This would make of lime a self hardener like cement and gypsum, which cementing materials do not need the use of any help from the atmosphere for hardening throughout the mass."

Lime and Cement

THE "desiccation" and "hydration" methods of hardening are used to make cement mortar more plastic by the addition to it of hydrated lime. The mason likes a lime he can "feel" and Mr. Hart, Manager of the Construction Department, waxes eloquent on this point. The addition of hydrated lime very slightly retards the setting of the cement but not enough to interfere with quick construction, the effect usually being noticed only by the mason who thereby has time to do what he likes to do, and believes should be done, to obtain a bed of uniform thickness between layers of brick, thereby securing uniform bearing which of course makes for uniformity of strength. The lime with its affinity for moisture holds it until the cement demands it, when it is given up gradually and prevents too rapid a hardening of the cement, the inert lime then becoming one of the aggregates in the compound, filling the pores and thus increasing the density of the cement mortar. Without the lime it is claimed the setting and hardening of the cement leaves the mortar porous after the contained water is absorbed.

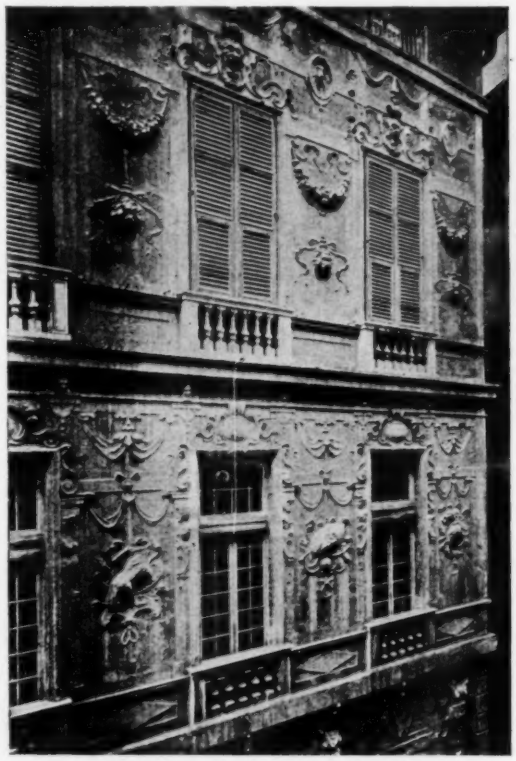

FIG. 4. EXTERNAL STUCCO-DURO FROM THE PALAZZO PODESTA, GENOA. ERECTED 1503

Mr. Hart in his paper, "Wetness versus Fatness" argues from the proven value of hydrated lime in cement mortar that it is of equal value in mass concrete. Mr. Hart says, "Workability is the best word yet devised for the desired property; for 'plasticity' and 'flowability' cover only part of the meaning, while 'consistency' refers only to apparent wetness; but 'workability' like 'strength' has a wide application. Strength covers compression, tension, shear, torsion and combinations of all these properties. In the same way workability includes easy dumping, proper flowing past and around obstructions into complicated forms, freedom from segregation and air pockets, easy tamping and easy finishing. Up to the present time no one word in English has described this quality, but, 'One must *feel* it with his tool,' as the masons say."

The Good Old Days

MR. HART mentioned a contractor in Georgia who made the remark that the old fashioned shell lime was far superior to modern sorry limes.

For the benefit of believers in the glorious days of old it is the mission of men in the Construction Bureau to tell users that lime has not lagged behind other building materials, but has been greatly improved within recent years. A generation ago many rocks were used in lime manufacture which are not touched today. There are great differences in limestones and the chemist today directs the lime burner.

The modern shaft kiln in which the fuel is burned separately from the rock, does away with the mixture of fuel and ashes with the lime; permits of proper temperature control with uniform temperature throughout the kiln; permits of inspection at every stage and keeps the boulders moving, thus making the product exceedingly uniform.

Manufacturers have cut down the time and cost for manufacture and introduced improved methods of handling. In the good old days only lump lime was produced, which had to be slaked and cured on the job. Today hydrated lime in the form of powder is in general use, greatly decreasing expense and making it as convenient as cement for all purposes. Modern contractors cannot afford the time necessary for slaking and aging lump lime and the scientifically slaked hydrated lime in the form of a fluffy powder caters to the speed spirit of today.

Machine Mixed Mortar

MR. W. C. HAY of Los Angeles gave an interesting description of the development of mortar mixing machines. He described the process of slaking, aeration and curing, telling about deliveries to buildings several miles from the plant. He quoted the following interesting retail prices at the mixing yard:

Brick laying mortar	$4.25 per cu. yd.
Fibered lime plaster mortar	6.00 per cu. yd.
Keene's cement gauged lime plaster mortar	9.50 per cu. yd.
Lime putty	18.90 per cu. yd.

FIG. 5. THE "FISH ROOM" CEILING, AUDLEY END, ESSEX

The finest existing example of the pendentive type of plastered ceiling, executed during the period of the highest development of plaster work

Cartage costs $1.00 per cu. yd. extra for any distance up to three miles, after which there is an additional charge of 15 cts. per cubic yard per mile or fraction of a mile.

By comparison he gave the cost of brick laying mortar mixed on the job as varying from $6.00 to $7.00 per cu. yd. and plaster mortar at about $13.75 per cu. yd. The machine mixed mortars are considered by masons and plasterers to be far superior to the more expensive hand mixed mortars prepared on the job. The violent agitation of cured lime putty reduces it to a thick fluid with an increase of 25 per cent. in spreading capacity. This

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thorough aeration cannot be obtained by hand within a reasonable cost.

Mr. Shertzer, Construction Engineer for the Eastern Bureau stated that modern lime mortar mixing machines used the principle in use 1500 B. C. in Egypt. In those days, the best lime mortar was beaten with oak staves by slaves and cut with metal knives, these processes being alternated until the lime was of a creamy consistency and free from lumps. Mortar thus prepared was hard and durable.

Examples of Lime Plaster Work

MR. SHERTZER on the last day gave an illustrated talk on the durability of good lime plaster. Fig. 1 is from Dr. Wm. Flinders Petrie's work "Tell-el-Amarna" and shows the condition of a floor in a room 20 x 60 ft. in 1916. This floor was laid about 1500 B. C. and the colors were wonderfully bright when the excavators laid the floor bare. In a near-by storeroom some of the original pigments were found and the illustration in the book was colored with paints in which these pigments were used. The surface of the floor when found was as hard as when new, despite the passage of 3416 years and probable use for many years before the desert sands covered it from view.

This floor was probably laid in the manner described by Vitruvius who spoke about three thin layers of lime and sand mortar placed and beaten, followed by three thin coats of lime and marble dust mortar also beaten, in which durable pigments were frequently used. The hard surfaces were often colored with oil paints and he stated that the surface of well finished stucco reflected images.

Fig. 2 shows a detail of part of a vault from a tomb in the Via Latina, Rome. The lower portion, in relief, resembles fine carving. At the top is a painted panel. Vitruvius states that persons used to get slabs of plaster from ancient walls and used them for tables, the material being so beautiful in itself.

According to Banhart "The Art of the Plasterer" from which Fig. 2 to Fig. 5, inclusive, were taken, the best quality hard surface lime plaster was known as "Stucco Duro" and the common lime plaster was known as "Parget," or "Parge." Today the word "stucco" is practically confined to plaster on the outside of a building, exposed to the elements.

Common walls for homes of the poorer classes in England in the fifteenth century were of "Wattle and Dab," or "Daub" according to locality, as shown in Fig. 3. The frame and studding of hewed timbers show at "A" and "B." Small branches and withes of willow and other trees were woven between and around the studding like rough basket work as shown at "C." The spaces were filled with mud and a coating of mud placed on the walls as shown at "D" and "E." The final coat of parget is shown at "G." This picture of a building over three hundred years old not only shows the original materials but at "F" is seen the back of some modern plastering on laths done when restorations were recently made.

Fig. 4 illustrates exterior lime plaster work and Fig. 5 interior lime plaster work of stucco-duro. The showing made of properly executed lime plaster indicates that on the score of durability it has nothing to fear from newer materials. In the element of time required in which to harden it is suffering a present disadvantage, which, in view of the present scientific attitude of the lime manufacturers cannot long endure.

BRICKS of CONCRETE with TEXTURE of CLAY

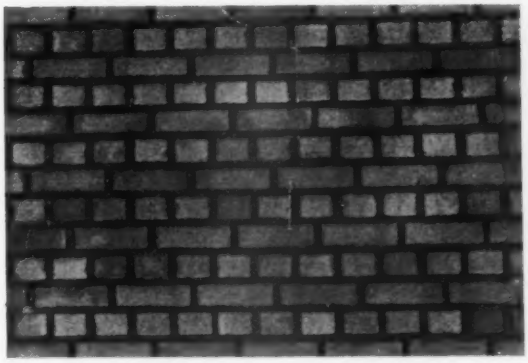
AWAY back in ancient times before the dawn of recorded history men used small rectangular blocks of clay for building walls. At first dried in the sun and later burned in kilns, they have persisted through the centuries because nothing better has been produced for the purpose. The size is that most conveniently held in one hand and recent attempts to save cost of labor by making units equal in size to several brick have not met with unqualified success. It is not only a question of cost of placing, but it is a question also of appearance, for people have grown accustomed to seeing brick walls and like them. Large hollow units of clay simply serve as background for stucco exterior walls or plastered interior walls. Concrete blocks are not brick and cannot imitate brick, not always being a good imitation of stone unless one wishes to pay for hand cutting.

Because building brick have been made of clay since men began to use this convenient building unit, a feeling has grown up that brick made of other materials are imitations. Definitions should never be forgotten. A brick is a rectangular unit of material of convenient size to be held in one hand. We have bath brick for cleaning purposes, ice cream bricks, etc., and in prosperous times when money is easy the newspapers record sales of gold brick, all of which should be borne in mind when men talk about bricks.

Along with the genuine liking which exists for brick walls has grown up a liking for the texture peculiar to clay brick. It is because of this that men who use other materials must produce brick with a surface texture not distinguishable from clay. Recognizing this fact, the question naturally arises as to why men should endeavor under such handicaps to produce building brick of any material other than clay. The answer is that in some localities and

XUM

under certain conditions these other materials are lower in first cost, this being notably the case in some parts of the United States today. For good face brick with smooth surface and for enamel faced brick no question of body material arises for only the face is seen.



A WALL OF CONCRETE BRICK WITH FLUSH JOINTS

Mr. Carrere once had to use a lot of white enamel faced brick and asked Mr. Crozier, who was making brick of concrete, to experiment for him. It was at that time not wholly a question of cost, speed in completion of his work and a shortage of good enamel face brick causing considerable embarrassment. A white brick was produced in which the aggregate was white marble and the matrix was white portland cement, the cement film on the face being washed off with acid. These brick were substituted for the white enamel faced brick originally specified, the texture of the acid-treated marble aggregate being highly satisfactory.

The experiments were continued with a view to lowering cost of manufacture and today the face brick consist of a body made of wet-process pressed concrete with a facing layer containing any desired aggregates. These brick compare favorably in appearance with clay brick similarly faced and compete successfully in price. The latest development has been the production of brick without a special

A WALL OF CONCRETE BRICK WITH RAKED JOINTS

facing which imitate in appearance ordinary clay building brick. They, of course, have a trade name, "Crozite," which applies to all brick made of wet concrete in the machine of Mr. Crozier. The wet-mixed concrete is placed in a high vertical tube and

REST BUILDING OF CONCRETE BRICK IN A MILWAUKEE PUBLIC PARK
ALFRED C. CLAS, *ARCHITECT*

pressed out at the bottom in a manner resembling the pressed-clay process. At the bottom the brick are cut off so that the surface texture cannot be distinguished from that of clay brick.

The brick are colored by the makers to match any given shade and are made in standard size. There was a brick shortage lately in the vicinity of New York and Mr. Crozier supplied his brick made of concrete to a number of builders, who worked them into clay brick walls and no one could see any difference in the texture of these walls. The price was somewhat lower per thousand than the then ruling price of clay brick. The Rest Building here illustrated was built several years ago in a public park in Milwaukee, Wis., of Crozite brick, ornaments in walls and columns being of terra cotta. The two smaller cuts are from photographs of recently built walls showing admirably that a brick after all is merely a wall unit of most convenient size and may be fabricated in any material possessing proper strength and durability, properties which no one denies are possessed by properly made concrete. Recent tests at Columbia University make a favorable showing for concrete brick.

IRON AND STEEL

A Discussion of Steel Making Processes As Applied to Iron Manufacture

IN building construction iron and steel are used for two general purposes. Steel is used for structural purposes because of its strength measured in terms of weight. The sections employed are heavy and substantial. Durability is secured by applied protection of various kinds. For uses other than structural, strength is not the greatest of the essential elements and the sections are usually thin and light in weight. Their exposure to the elements is generally severe in buildings and this requires care in the selection of protective coatings. Protective coatings at best have a limited capacity for service, measured in terms of time, and, therefore, the inherent durability of the material is an important factor. Being used in light sections, the effects of corrosion are more disastrous than in structural parts where there is usually a margin or factor of safety allowed for this and other causes.

The first step in the manufacture of iron and steel is the smelting of the ore in a blast furnace and the production of cast or pig iron from which is made iron foundry products, wrought iron and steel.

According to Sauveur, chemically pure iron is not a commercial product and can only be obtained in small quantities by carefully conducted laboratory manipulations. Therefore, it is reasonable to eliminate pure iron from commercial consideration for it would probably rust more quickly than the commercial products. It should be remembered that all metallic ferrous compounds are susceptible in some degree to corrosion. Commercial iron is always contaminated by the presence in greater or less degree of at least five elements,—manganese, silicon, phosphorus, sulphur and carbon.

Wrought iron is the commercial name for iron free enough from carbon and other impurities to be malleable. It is made by refining pig iron in a non-regenerative reverberatory furnace (the puddling furnace) where it is worked up into pasty balls by hand operated tools by a process known as puddling. This process consists of "removing from the pig iron nearly all of its carbon, silicon, manganese and most of its phosphorus and sulphur by agitation in the presence of suitable cinder and gases of the proper composition and temperature, and by crystallization, due to the greater infusibility of the iron as the metalloids are oxidized.

The puddle balls, in a pasty condition, are taken from the furnace and mechanically squeezed into elongated masses known as "blooms." The blooms are rolled into "muck bars" or "puddle bars." The squeezing of the puddle balls into "blooms" expels a large amount of the slag and firmly welds together the particles of iron. The retained slag naturally is worked into the direction of the squeezing and rolling and gives to the iron its fibrous character and appearance.

"Wrought iron consists essentially of a mass of ferrite containing many elongated particles of slag." In both the longitudinal and transverse sections the ferrite grains are equi-axed, that is, they show no signs of having been elongated in the direction of the rolling. Microscopic inspection shows that there is no difference in the ferrite which forms the bulk of wrought iron and low carbon steel, both being equally crystalline. Therefore, the "fibrous" structure and "crystalline" structure of wrought iron and steel are erroneus ideas. The slag consists of ferric and ferrous oxides of iron, oxide of manganese, silicon and phosphoric acid. Its functions are those of protecting the iron against oxidation during the balling and in its passage to the squeezer and to offer resistance to corrosion.

The refining of cast iron for the production of steel is done in a Bessemer converter or in a regenerative reverberatory open hearth furnace. In this process the impurities are eliminated as much as possible by oxidation, aided by the fusing and oxidation of the materials placed in the bed of the

furnace. If on test, a larger content of carbon or other element is desired, it is added to the metal. The metal is reduced to a fluid state during the refining treatment and is cast into ingots which are later reheated in soaking pits and rolled into billets.

The reduction of the iron to a fluid state permits the separation of the slag due to the difference in the specific gravity of the slag and the iron. When the melted steel is cast into ingots, it is free from slag which is the only content distinguishing wrought iron from low carbon steel. Since wrought iron contains but a small amount of carbon, melting and casting it into ingots would convert it into low carbon steel. There are, therefore, three grades of low carbon iron known as "wrought iron," "ingot iron" and "steel."

Barring the presence of slag in wrought iron, both wrought and ingot iron may have identical chemical compositions. When iron is obtained in liquid form and contains little carbon, it is called low or very low carbon steel; mild, very mild or extra mild steel; or soft, very soft or dead soft steel.

If the presence of retained slag in wrought iron is conducive to resistance to corrosion, it would follow that this material is better adapted to resist corrosion than low carbon steel. Evidence is not produced which shows that this material possesses entire immunity from corrosion and consequently protective coatings secured by galvanizing, plating or painting must be applied. The tonnage of wrought iron produced in this country is but a small proportion of the total iron and steel production. Its production by hand labor materially increases its cost over the cost of steel.

As corrosion is the result of exposure, it necessitates the elapse of long periods of time to measure its action. Accelerated tests are not satisfactory because they are not natural tests. Time tests then are of real value.

(To be continued)

Column Tests to Be Conducted at Madison, Wis.

A SERIES of column tests which are of very broad, general interest will be made at the Forest Products Laboratory.

The work, which will cover a period of four years, is for the purpose of obtaining data on the effect of density and defects, such as knots, checks, cross grain, etc., on the strength of structural columns of both southern pine and Douglas fir. The data will be used as a basis for recommending safe working stresses for structural columns. It is estimated that 160 pieces of 12″x12″x24′ timber will be used. In conducting the tests use will be made of the new 1,000,000-pound testing machine at Wisconsin University. If possible the work will be started this summer.

As a Matter of Fact

The Editors, THE AMERICAN ARCHITECT:

THE June 22nd issue of THE AMERICAN ARCHITECT has just come to my desk and upon a casual perusal of the leading article in reference to the new Straus Building, Fifth Avenue and 46th Street, I note that the statement is made that the exterior walls are brick, faced with Buff Bedford Limestone.

This is an error as the building in question is faced with Variegated Indiana Limestone. The designation "Bedford," while not constituing an error, is an obsolete method of designating the product of this Industry. The statement that Buff Stone was used is an error, however, and in view of the variegated effect, may lead people to believe that part of the stone has become changed in color or stained, whereas the variegated effect was exactly what was desired. Therefore, we think that this error should be corrected in your next issue of this publication. INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION.

An Improvement in Magnesite Plaster

MAGNESITE PLASTER has been in the class of so-called "Patent" plasters for many years. The preparation on the job has called for a rather high degree of skill and considerable labor. The announcement has been made quite recently that several years of chemical research have had the satisfactory result of producing a powder which does away with former disadvantages. It is stated that this dry powder coming on the job in sacks may be mixed and applied with as little trouble as cement or hydrated lime.

Magnesite in 1920

THE year 1920 was a history-making year in the magnesite industry in this country. The shortage of the important product in the war period stimulated home development, with the result that production increased 94 per cent. in 1920 over 1919. The entire output was made in two states, California and Washington. Most of the California products were used as a plastic material, only a small part of it being used for refractory purposes. Practically all the Washington product, however, was dead burned and used for the lining of furnaces and smelters.

Sand and Gravel Production

ACCORDING to a recent bulletin issued by the United States Geological Survey, the total quantity of sand and gravel produced in 1920 was nearly 78,000,000 tons, or about 7,000,000 tons in excess of the 1919 output, a total value increase from about $46,000,000 to more than $62,000,000. The production of building sand increased nearly 4,000,000 tons. The output of molding sand increased more than 1,000,000 tons.

XUM

The AMERICAN SPECIFICATION INSTITUTE

Bulletins

THE first bulletin has been issued to all members and a number of criticisms and suggestions have been received. The Board of Governors have determined that semi-monthly bulletins shall be issued on the first and fifteenth days of each month, the series at first to consist of outlines for the various branches of work covered in the general outline which formed Bulletin No. 1.

* * *

It is hoped that it will very shortly be possible to start issuing additional bulletins covering materials and methods of construction and installation, making available to the members, in convenient and readily accessible form, all the interesting matter that now is distributed throughout many books and periodicals.

* * *

Members are requested to advise the office of the Executive Secretary what subjects they wish treated in these special bulletins and whenever possible the selected subjects will be given early attention.

* * *

It must be borne in mind that the activities of The American Specification Institute can only reflect the knowledge and spirit of co-operation of each one of its members. It is therefore very gratifying to know that some of the members have felt free to offer suggestions on some subjects that have been sources of annoyance to them.

The Secretary's Office

A NUMBER of offers of co-operation have been received from national associations, such as the Portland Cement Association, these letters suggesting that they will be glad to be of service to our members in every possible way. Members who wish information that they have found it difficult or impossible to obtain are requested to report their desires to the Executive Secretary's office and if it is humanly possible the information will be procured.

* * *

It is interesting to report that a letter has been received from *The Times,* published in Bombay, India, enclosing a clipping from their Engineering Supplement, published May 20, 1921, in which the organization of THE AMERICAN SPECIFICATION INSTITUTE is reported.

* * *

In addition to this gratifying news from a distant country it should be noted that the Engineering Association of New South Wales, Sydney, Australia, has sent a letter expressing the hope that the Specification Institute will be successful and that its members may be enabled to receive some benefit from our activities.

THE AMERICAN SPECIFICATION INSTITUTE
Gardner C. Coughlen,
Acting Executive Secretary.

CURRENT NEWS

Happenings and Comments in the Field of Architecture and the Allied Arts

Course to Aid Housing

WITH a view to helping solve the housing problem, Columbia University, New York, will use this summer the equipment of the School of Architecture for special studies of dwelling house construction and design. The university's announcement of this plan says:

"Special courses of lectures and drafting, dealing with the problem of the small house, the medium size house, the two-family house, the apartment house and others will be opened to all those who are seeking accurate information about the design, construction and equipment of these buildings. In giving these courses the school feels that it is opening its equipment for a broader public service at a time when the need is at its peak.

"Other courses intimately connected with domestic architecture will be given, such as architectural drafting and architectural model making, in which the student will be trained to express himself with drawing and the making of three dimensional models."

Soviet Russia Plans to Sell Art Treasures for Food

SOVIET Russian officials are putting into effect a decree that Russian art treasures, seized from palaces and from private individuals, shall be placed on the market and sold abroad to buy food. The decree provides for the creation of a "state fund of valuables and art luxuries," to be controlled by a committee of educators.

Many of the most famous paintings, statues and objects of art in the world will thus be thrown on the market when the plan is in operation. For many months these treasures have been collected and stored in houses at Petrograd and Moscow, where they have been catalogued by experts.

Whitney Warren's Plans for Louvain Library Accepted

IT is announced that the plans for the reconstruction of the library at Louvain, France, prepared under the direction of Whitney Warren, have been accepted by a committee of which Cardinal Mercier is the head, and that work will probably begin in July. The cost of this reconstruction is estimated at $1,000,000, of which $300,000, it is learned, have already been subscribed. It is not proposed to erect the new building on the site of the former library, but on a location in the center of the city.

Frame House in Plymouth, Mass., Built in 1677 Yet Standing

ONE of the most interesting features of the Tercentenary Celebration of the landing of the Pilgrims, to be held at Plymouth, Mass., during the coming summer, will be the opening to the public of the William Harlow house, built in 1677. This is one of the few buildings now remaining which stood within the lifetime of any of those who came on the "Mayflower," and it has a particular interest, owing to the fact that it was framed with oak timbers from the old fort, which, as Winslow relates, "was built in 1622 on the top of the hill under which the town was located."

After King Philip's War, when danger from Indian depredation had passed, the fort was dismantled and the timbers sold to Sergeant William Harlow, a man of prominence in the colony, who used them in the construction of his house on the ancient highway where it still stands.

About forty years ago, in repairing the house, the oak posts and beams were uncovered and the ancient mortises, made in fitting the frame of the fort, were disclosed. An old hinge was also found, which is one of those on which the gate of the fort hung.

There is thus established in this house a connecting link between the founders of the first permanent settlement in America, three hundred years ago, and the present generation.

Origin of Macadam

DURING recent "genealogical" research work at the Congressional Library, the following was found among the files of the "Gentleman's Magazine" (The Book of Scotsmen) published in January, 1837:

"John Loudon Macadam, surveyor, was born in Ayrshire, Scotland, 1756. In 1815 he was made surveyor general of the Bristol (England) sections of highways, where he effected many improvements in road constructions.

"In 1822 he published his 'Observations on Roads,' which, though it is in various respects erroneous, affected a salutary revolution in the system of road-making, by establishing the supreme advantages of roads covered with a layer of stones broken into small pieces, without any admixture of sand, clay, or other material. Roads covered in this way are said to be 'Macadamized.'

"Macadam, in reward for his public services, received from the government, in two grants, the sum of £10,000."

XUM

Building a Five-Room Bungalow in Ten Hours

AN example of the rapidity with which the housing shortage may be overcome was given recently by the Lumbermen's Association of Chicago, when 30 workmen employed by the association erected a five-room bungalow in ten hours. The task included the installation of electrical and plumbing fixtures and decoration of the interior of the house.

Des Moines Only City in the World Having Municipal Observatory

DES MOINES' municipal observatory has recently been opened to the public, in accordance with the plans formulated by its sponsors, states *The Improvement Bulletin.*

Work on the observatory building, interrupted during the winter, was resumed April 1, and the dedication took place about the third week in June.

With the opening of this institution Des Moines will become the only city in the world to have a municipal observatory although there are several observatories which are open to the public at stated periods.

The city of Des Moines is furnishing the material and men for the erection of the building, which is located upon the highest point in Waveland park. A lecture hall and instrument room will be the main features.

Instruments will be furnished by Drake University and instructors from the university will demonstrate the use of the large telescope and other instruments and will give illustrated "talks" in order that the public may "see the universe." Lectures and instructions will be under direction of Dean D. W. Morehouse, of Drake University, who will personally deliver many of the "talks."

For Town Hall in Every City

THE Town Hall designed to be a civic center in New York City for public meetings of all kinds related to the general welfare illustrated in a recent issue of this journal, should serve as an example to every town and city, states the American Magazine of Art. This hall, admirably designed by the well-known architectural firm of McKim, Mead & White and appropriately decorated under the supervision of Mrs. John W. Alexander, promises to become not merely a civic center but a real force in civic education for the people of greater New York. In arranging programs for the opening week care was taken to give indication of the way in which this hall might serve as an instrument for a more enlightened citizenship. It was, therefore, of the utmost interest to find that one session was devoted to the popular appreciation of literature and art, thus indicating a conviction on the part of the founders that art is a factor in civic life as truly as the so-called practical and humanitarian subjects such as education, government, charities, etc.

Too much cannot be said in praise of the public-spirited, right-thinking movement which has found expression in the New York "Town Hall"—an institution peculiarly American and calculated to raise the whole standard of citizenship through normal methods on a sound basis. There is no reason why every city and town in the United States should not have a similar institution conducted on like methods.

Profiteers Forced to Build

SWITZERLAND has found a new use for war profits. The Swiss who reaped an excess profit during the war can get an abatement of taxes if he will invest his surplus in residential housing under official regulation. The regulation guards against unsightly and unsanitary building. It also restricts rentals to yield only a fair return on the investment. If the war profiteer does not care to put his easy money into this useful channel of public service at a fair return, the state takes a large part of it from him and itself subsidizes the building of homes.

Architectural and Building Exhibition in Liége

AN important exhibition is being organized at Liége, Belgium, by the Liége Association of Architects. The exhibition will be held at the Palais des Beaux Arts, Parc de la Boverie, overlooking the Meuse River, and will be open during the months of August and September next. Meetings of the National Congress of Belgian Architects will also take place during this period.

The exhibition will be divided into three sections, the first section being strictly architectural. Members of the Liége Association and their guests, the architects of allied countries, will exhibit works, both executed or in project.

The second part of the exhibition will be taken up by numerous examples of ancient and modern furniture, of all periods, executed by Liége cabinetmakers, carvers and joiners. The excellent work executed in the past by these artists is well known and it is pointed out that Liége craftsmen of the present day have lost nothing of the art of their ancestors.

The third section of the exhibition will deal with new methods of building construction.

Meetings of the Congress are being called by the Federation of Architectural Societies of Belgium, Monsieur A. Snyers, Architecte diplômé, Liége, being president of the Federation, and also president of the Liége Association.

Enquiries can be addressed to "Secretariat général," Exposition d'Architecture, 3, rue de la Boverie, Liége.

REVIEW of the CONSTRUCTION FIELD

With Reports of Special Correspondents in Regional Centers.

The Business of Government and Business by the Government

PEOPLE who object that 68 per cent. of government expenses are incurred for national defense, regard themselves as discoverers of new facts. The truth is that government exists merely for the purpose of preserving a national entity. Properly organized, a government should see that natural economic laws are not set aside by powerful business combinations, to the end that free wholly legitimate competition may not be hampered. The natural law of supply and demand, or of production and consumption, will then operate and the greatest possible benefit will be secured by the individual whose taxes support the state. Ideally administered, nobody will object to paying 68 cents on every dollar of taxes collected in order to guard against loss of rights founded upon justice and morality. In the ideal government defense of the rights of the people should properly be the largest item of expense.

A false idea of "The State" as a personal Deity and an implicit faith in miracles continuously operating to set aside natural laws for the benefit of active minorities accounts for all the troubles into which the world has fallen. It is time a realizing sense of this truth were brought home to politicians. The real business of government is to keep the government out of business. The politicians alone seem not to realize this at the present moment, and by politicians is meant not only office holders, but the large number of people who approach the idol of brass and clay to right the wrongs of which it alone is the cause.

THE United States is contemplating a housing policy which will increase taxes in spite of the paralysis of business in England brought on by a similar policy there. We are in danger of becoming mendicants of government forgetting that we are the government. No matter how many new ways may be devised for buying things, no one has discovered a method for paying which supersedes the time-honored method of putting the hand into the pocket to find the coin. It may be true, as Sir Matthew Boyle said, "Posterity has done nothing for us," but that is not a good reason why we should so act that the belief of posterity in a simian ancestry may be strengthened.

The editor of *The Architect,* London, has the following to say about conditions in Great Britain on the interference by politicians with the orderly conduct of business according to economic laws:

> The present position of national chaos is clearly attributable to two causes, which are dealt with in a book written by Lord Rothermere, entitled "Solvency or Downfall," and forms a re-publication of a series of newspaper articles which might have been brought up to date by the inclusion of reference to the culminating misfortune of the present coal strike.
>
> With most of the conclusions of the writer we are in agreement, and some of them might be stated even more strongly. The two great mistakes which have led up to our misfortunes are, as Lord Rothermere states, the failure of those in authority to understand that the colossal expenditure of war time cannot be continued in times of peace, and the inability of Labour to recognize that only by increased effort and production can it hope to produce a betterment of conditions. The slackness, insincerity or stupidity of politicians has made our governmental policy socialistically antinational, while it has consistently imposed heavy burdens on the taxpayer and spent the resources of the country on objects which evoke no enthusiasm among any section of the people.
>
> Formerly, if we spent money in the administration of a foreign country we at least obtained some advantage from it; now we are indirectly promoting trouble for ourselves in Egypt and India, while at the same time we make concession after concession to our avowed enemies. More than this, our Government has a perfect avidity for accepting "mandates" from the League of Nations for the philanthropic administration of countries like Palestine and Mesopotamia, which cost us heavy sums, without compensating advantages, at a time when everyone is burdened with excessive taxation. We, therefore, quite agree that the time has come to eliminate foreign adventures, but which the public conscience or public apathy determine shall not be of commercial advantage to us, and to cut down our armed forces to a minimum.
>
> We agree with Lord Rothermere that the new Education Act is, at any rate, a mistake in the present time, and that the absurd housing policy of the Government should be ended. We have not the means to subsidize colliers, railway men, or people who want cheap houses; and the greatest necessity of the time is the reduction of bureaucracy to its smallest limits. It will probably take years to do away with the pernicious belief that politicians have fostered in the minds of the people that by legislation we can interfere with advantage between employer and employed, for in the end such attempts come down to demands on the taxpayer for the benefit of small sections of the community who make claims for doles in continuous succession.

Why America Is Not Rebuilding France

AMERICANS do not seem to be playing a large part in rebuilding the housing facilities of France, and the editor of the *Engineering News Record,* who has been visiting in that country, gives some reasons for this in a letter to his publication.

In the first place, the French do not wish to admit that they need this sort of help. Aside from financing the new work and getting necessary raw material, they appear to be eager to do everything themselves. In addition to this, and perhaps of even stronger influence in shaping French opinion, it is clearly apparent that French traditions are incompatible with

XUM

the mass-production proposed by some of the larger American contractors.

The French want to rebuild according to French ideas, having regards also for the traditions of ruined cities. Mass-production, with its inevitable sameness in thousands of structures, runs counter to these ideas and traditions. Furthermore, the French have pride in their ability to carry on construction in their own way, and construction cannot, in their judgment, be rushed. It can be taken in hand only as fast as the damages can be determined, and in the order of its economic importance. Building materials are scarce and must be distributed so that all districts and towns may make progress at about the same rate. They do not wish to hurry the permanent rebuilding of ruined cities.

Doubtless the strongest reason for all those mentioned is the desire to preserve French traditions and to carry out French ideas of architectural harmony. Even the country villages of France are picturesque and characteristic of the people who live in them. To one who knows the French character it is impossible to imagine in that country a mass of buildings substantially the same in appearance and actually the same in interior arrangement and equipment. We may not hope to introduce to the French the mass-construction in dwellings that some of our American contractors manage to impose on the people of our own land.

France may not rebuild as quickly as she would with the active aid of our rapid mass and factory-construction, but when she has the job finished to her liking the result will not be likely to violate French traditions and to be repugnant to French taste. It appears that our best way to help the French in their rebuilding is to do what we can in the way of financing and supply needed raw building materials and allow French taste and skill to do the actual building. We may make suggestions for what we would consider improvements and be ready to help where help of the sort we have to offer is needed, but wisdom counsels that we exercise much patience in the progress of having our suggestions accepted.

BUILDING CONDITIONS on the PACIFIC COAST

(Special Correspondence to THE AMERICAN ARCHITECT*)*

SEATTLE.—Uncertainties as to future prices of sheets, pipe and other building essentials of the steel family have served to soften a movement which had taken on fair proportions with jobbing houses of the Pacific Coast. Coast jobbers have been advised that Steel Corporation mills will meet competition in sheets and pipe down to sacrifices of $25 per ton, and this, added to the prospective reductions in rail freight rates from Pittsburg has scared buyers out. The feeling among them is that to buy now would give a competitor an advantage in both basic products cost that would be embarrassing later, and a general silence is felt from the trade and investors.

There has been a gratifying movement of galvanized pipe of halves and three-quarters such as is most generally used on the coast for apartment houses and dwellings. The home building, while not heavy from an individual unit base, has been great this summer in the total. Homes of $2,500 to $6,000 have been the most popular. Low lumber costs, with partial reductions in building labor, have helped materially in wooing investors from the discouraged frame of mind into which they had fallen. Building permits in Seattle in May totalled values of $1,566,005, compared with $1,809,160 for May of last year. While there was a falling off in the total, there was a gain when comparisons are made between the buying power this season and last.

There have been many alterations and additions. Of the 1,044 permits issued in May, 486 were for alterations, seven for fireproof structures, four for slow-burning construction units, two for masonry buildings, and 521 for frame structures. The total estimated value of construction this year to date in Seattle is $6,585,225.

EASTERN rail lines after battling contrawise for several months, have consented to reductions in sheet rates from Pittsburg to Puget Sound, and it is now felt certain that these reductions will shortly be instituted. The old sheet rate is $1.66. The new will be $1.05.

The cement market is firm. Production on the Coast is at capacity and there is little reserve. The jobbing trade is selling only 30 per cent. of the cement moved last year, and it is inferred from this that the bulk of the products is going into road construction.

The fir lumber market is steady, with mills closing down for the July period all over the territory. Eastern rail enquiry is light owing to the prospective reductions in freight rates by rail and water. The railways will buy no maintenance lumber this summer, and this is weakening special cuttings, while holding the upward tendency in finishing lumber in check. Cedar logs are very scarce and prices of cedar siding are higher at $34 and $36 at the mill. Average sales of standard building sizes at the mill are $49 for No. 2 vertical grain flooring, $25 for No. 3, $19 to $21 for slash grain, $20 for ceiling, $20 for drop siding, $10.50 to $13 for boards and shiplap, and $13.50 for plank and small timbers.

MONUMENT OF GASTON DE FOIX, RAVENNA, ITALY